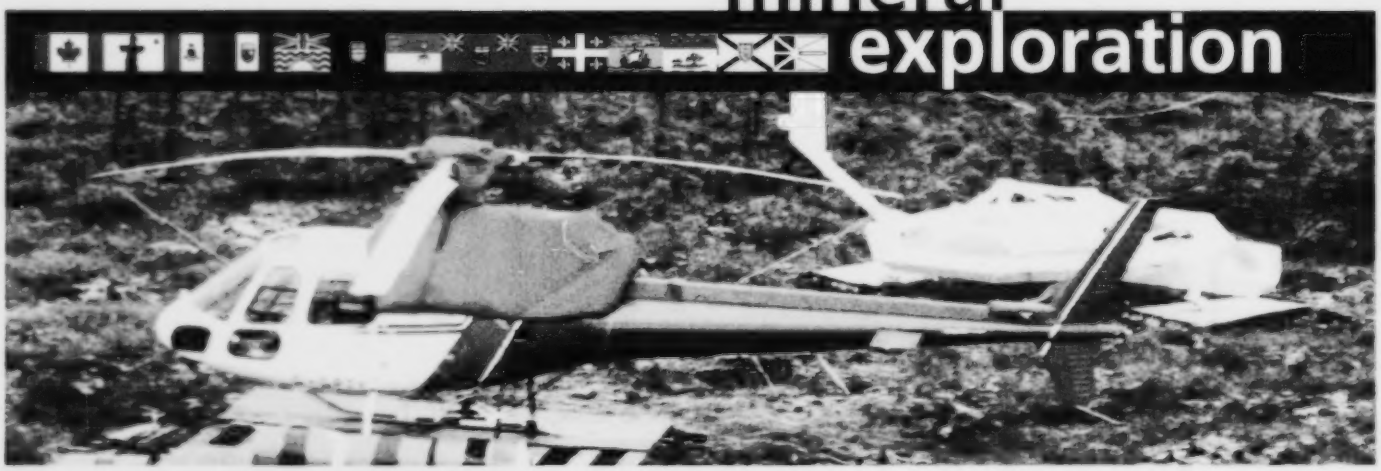
Overview of Trends in

Canadian mineral exploration



CANADIAN INTERGOVERNMENTAL WORKING GROUP ON THE MINERAL INDUSTRY

2008

Overview of Trends in

Canadian mineral exploration

Canadian Intergovernmental Working Group
on the Mineral Industry

2008

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This publication was prepared by:

Minerals, Metals and Materials Knowledge Branch
Minerals and Metals Sector
Natural Resources Canada
Ottawa, Ontario K1A 0E4

Telephone: 613-995-0947
E-mail: questions@nrcan-rncan.gc.ca

It is also available on the Internet at:
www.nrcan-rncan.gc.ca/mms-smm/busi-indu/cme-omc-eng.htm

Cette publication est aussi disponible en français, sous le titre
Survol des tendances observées dans l'exploration minérale canadienne

COVER PHOTO REPRODUCED WITH PERMISSION FROM NORONT RESOURCES LTD.

The cover photo shows a helicopter-borne AeroTEM system used for geophysical surveying on the Ring of Fire project of Noront Resources Ltd. Located within the McFaulds Lake area in the James Bay Lowlands of Northern Ontario, this project includes the original discovery, in August 2007, of the Eagle One nickel-copper-platinum-palladium deposit, as well as the Eagle Two copper-nickel deposit and the Blackbird One and Blackbird Two chromite discoveries. After completing a National Instrument 43-101 compliant resource estimate for Eagle One, Noront plans to further explore these deposits and other nickel-copper and chromite targets in 2009.

Preface

The *Overview of Trends in Canadian Mineral Exploration* report is prepared annually, on behalf of the Intergovernmental Working Group on the Mineral Industry (IGWG), for presentation to federal, provincial, and territorial mines ministers.

The 2008 edition of the report contains an analysis of recent indicators of exploration and deposit appraisal activity in Canada, a review of the worldwide activities of the larger Canadian exploration and mining companies, and a statistics-based summary of Canada's post-1980s mineral exploration history.

This edition also features two new developments: the move to an electronic-only delivery format (paper copies of the report will no longer be available) and the replacement of the Regional Outlook section by a listing of provincial/territorial web sites that provide access to a fuller range of information, data, and analysis that is updated in a more timely fashion.

The information and analyses found in this publication were prepared by officials of Natural Resources Canada (NRCan). The Minerals and Metals Sector of NRCan was responsible for compiling, editing, producing, and distributing this report, which covers exploration and deposit appraisal activities for metallic minerals, nonmetallic minerals, coal, and uranium (it does not refer to petroleum-related work). The information in this report was current as of December 2008. Information and analyses found on provincial/territorial web sites are the responsibility of the respective jurisdictions.

The report can be accessed via the Minerals and Metals Sector's web site at www.nrcan-rncan.gc.ca/mms-smm/busi-indu/cme-omc-eng.htm.

NOTE TO READER

This report has been prepared on the basis of information available at the time of writing. The authors make no warranty of any kind with respect to the content and accept no liability, either incidental, consequential, financial or otherwise, arising from the use of this document.

Contacts/Information Requests

For further information on specific issues related to this report, the reader is invited to contact the Minerals and Metals Sector of NRCan or one of the federal officers listed below. Contact informaton for the provinces/territories is provided in Chapter 2 (Regional Outlook) of this report.

NRCAN CONTACTS

Natural Resources Canada (Ottawa) (Minerals and Metals Sector)	613-995-5379 www.nrcan-rncan.gc.ca/mms-smm/
Louis Arseneau (project coordinator and principal editor)	613-995-0959 louis.arseneau@nrcan-rncan.gc.ca
Ginette Bouchard (Canadian exploration statistics and analysis)	613-992-4665 ginette.bouchard@nrcan-rncan.gc.ca
Arlene Drake (Ore reserves, mineral discoveries and global presence)	613-992-7568 arlene.drake@nrcan-rncan.gc.ca

SOME NRCAN WEB SITES

Minerals and Metals Sector	www.nrcan-rncan.gc.ca/mms-smm/
Mineral Exploration	www.nrcan-rncan.gc.ca/mms-smm/busi-indu/mex-exm-eng.htm
Minerals and Metals Markets	www.nrcan-rncan.gc.ca/mms-smm/busi-indu/mmm-mmm-eng.htm
Minerals and Mining Statistics	http://mmsd.mms.nrcan.gc.ca/stat-stat/index-eng.aspx
Mining Taxation	www.nrcan-rncan.gc.ca/mms-smm/busi-indu/tax-fis-eng.htm

Executive Summary

This report covers the years 2007 and 2008, a period that will be remembered as the onset of a major worldwide economic downturn that has its roots in the U.S. sub-prime mortgage crisis. Reduced demand for minerals and metals, edgy capital markets, and insecurity related to the ultimate extent and duration of this economic collapse have brought to a sudden halt the period of prosperity that the minerals and metals industry was enjoying as a result of highly favourable commodity markets.

In terms of mineral exploration and deposit appraisal activity, statistics from the federal-provincial/territorial Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures show that 2007 was another year of exceptional growth despite the gathering economic storm. In fact, the total expenditures of $2.8 billion recorded in 2007 represented a new all-time high in the history of mineral exploration in Canada.

With revised spending intentions of $3.1 billion for 2008 (collected between March and June 2008, and current as of December 2008), the Canadian mineral exploration sector appeared poised for another all-time record as well-funded companies continued to invest heavily in their projects, even as the market outlook worsened. However, due to a rapidly deteriorating economic outlook, indications are that this forecast was likely overstated and that, in the end, 2008 spending may in fact approach the level of 2007. A final compilation of actual 2008 spending will be released later in 2009.

This latest growth period was characterized by a strong focus on off-mine-site and exploration-phase spending, both inside and outside of traditional mining camps. It was also highlighted by the emergence of the junior mining sector as the dominant force in the Canadian mineral exploration and deposit appraisal sector. The favourable market outlook that led to exploration and deposit appraisal spending records was so broad-based that the overall effort was distributed among many mineral commodity targets and regions.

In fact, this intense period of activity led to the announcement of numerous mineral occurrences and discoveries, upgrades of resources and reserves, and the advancement of many projects. Responsible authorities in the provinces and territories can provide information on these developments, and links to their web sites are provided in Chapter 2 of this report.

In the midst of this economic turmoil, Canada continues to be the top destination in the world for exploration capital. In 2008, some 21% of the mineral exploration programs planned by the world's large and small companies was expected to be conducted in this country. As for Canadian companies, they were expected to account for almost 43% of all exploration programs undertaken in the world in 2008, a share that is by far the largest of the global mineral exploration effort.

With the global economy reeling from successive economic and financial shocks, and with no recovery yet in sight, 2009 will be a difficult year for most economic sectors. For mineral exploration and mining companies, this uncertain economic environment translates into lower commodity prices, risk-averse equity markets, reduced and more expensive debt financing, and cost-cutting pressures on existing projects and operations. Although work will continue, possibly at a reduced pace, on many of the properties that are so important for the pipeline of future Canadian mineral development projects, 2009 should mark at least a break in the upward trend in exploration and deposit appraisal spending that has prevailed for the past eight years.

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1. Indicators of Mineral Exploration and Deposit Appraisal Activity in Canada

1.1 INTRODUCTION

This chapter presents data and analysis on indicators of mineral exploration and deposit appraisal activity in Canada. Except where needed for comparing different data sets, it does not cover activities beyond the deposit appraisal stage, such as those related to mine development. The most important indicator is spending and, accordingly, most of the analysis focuses on expenditure trends and patterns. Chapter 1 also provides analysis on two other indicators of exploration and deposit appraisal activity: drilling and claim staking.

The federal-provincial/territorial Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures (the survey) provides a comprehensive breakdown of the mineral development cycle in Canada and is based on the Generalized Model of Resource Development.[1] For a better understanding of the survey and its definitions, the reader is invited to consult Section 1.2 and the *Reporting Guide for the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures*.[2]

1.2 SUMMARY OF SURVEY DEFINITIONS

In the survey, often referred to as the federal-provincial/territorial survey of mining and exploration companies, the *exploration* work phase is defined as the search for, discovery, and first delineation of a previously unknown mineral deposit or the re-evaluation of a sub-marginal or neglected mineral deposit in order to enhance its potential economic interest based on more appropriate tonnage and grade characteristics.[3] This work phase is completed when a deposit has sufficient indicated mineral resources accompanied by a "preliminary economic assessment" (scoping study) that justifies

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[1] The Generalized Model of Resource Development can be viewed on-line at http://mmsd.mms.nrcan.gc.ca/stat-stat/expl-expl/pdf/04_e.pdf.

[2] More information on the federal-provincial/territorial survey is available on-line at http://mmsd.mms.nrcan.gc.ca/stat-stat/expl-expl/guide-guide-eng.aspx. The reader should note that a different set of definitions is used in Chapter 3, which contains data and analysis on worldwide exploration activity and is based on data from the Metals Economics Group.

[3] Compliant with guidelines from the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) and National Instrument 43-101 (NI 43-101).

additional, more detailed and costly deposit appraisal work. The expenditures include all field activities and support, including capital, repair and maintenance expenditures,[4] carried out on- or off-mine-site.[5]

The *deposit appraisal* work phase is defined as the steps undertaken to bring a delineated deposit to the stage of detailed knowledge required for a bankable feasibility study that will justify and support a production decision and the investment required. The expenditures include all field activities and support, including capital, repair and maintenance expenditures,[4] carried out on- or off-mine site.[5]

Overall, the survey allows a detailed cost breakdown of total exploration and deposit appraisal expenditures into categories that include the traditional field work and overhead costs, but also include costs related to engineering, economic and feasibility studies, the environment, and land access.

1.3 EXPLORATION AND DEPOSIT APPRAISAL EXPENDITURES

Exploration and deposit appraisal expenditure levels usually provide a good indication of the current state of Canada's mineral exploration sector and insight into the future of the country's minerals and metals production capacity. However, when the economic context evolves as rapidly as was the case in 2008, the survey can show a lag in recording a sudden drop in activity because of timing considerations. Similarly, a rapidly improving economic outlook might not register immediately in the Preliminary and Spending Intentions compilation, but would instead be captured in the following data collection (Actual and Revised Spending Intentions). Notwithstanding these limitations, the survey continues to provide relevant information, both in current and historical terms, and will continue to be relied upon to monitor the health of Canada's mineral exploration sector.

This section of the report contains an analysis of the 2007 and 2008 expenditure data.[6] The data for 2007 are considered to be final. The data for 2008 were first compiled between March and June 2008, and revised in December 2008. They will be finalized in 2009. This section also provides some coverage of the period 1997-2008. The analysis, figures, and tables presented in this chapter are, for the most part, denominated in current Canadian dollars. However, in order to keep an inflation-free perspective, some of the longer-term comparisons are also presented in terms of 2007 constant dollars (using the Gross Domestic Product deflator series).

1.3.1 2007 Exploration and Deposit Appraisal Expenditures

1.3.1.1 Statistical Summary

In 2007, 842 companies (project operators) spent $2824 million ($2831 million when including prospectors) on mineral exploration and deposit appraisal in Canada (**Figure 1** and **Table 1**). That

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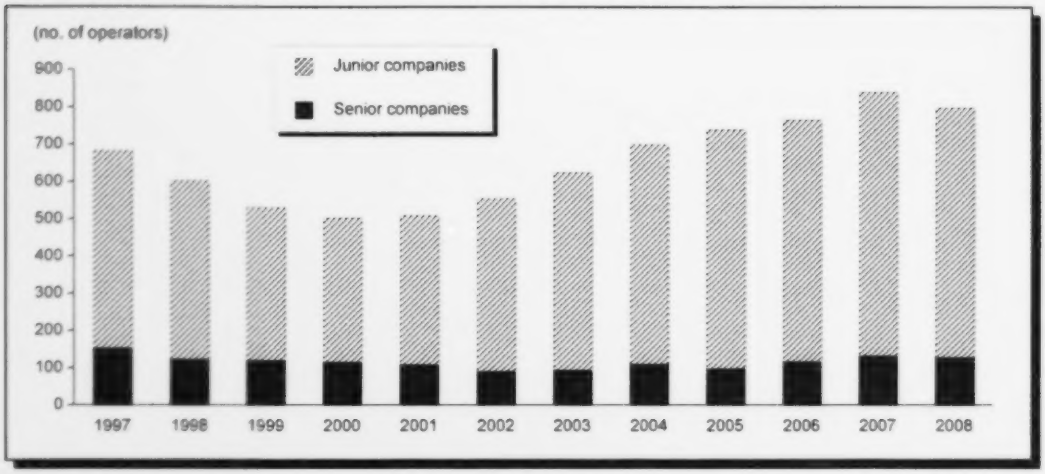
[4] Repair and maintenance expenditures apply only to capital assets (construction, machinery and equipment) and not to field expenditures.

[5] A mine site is the area that can be accessed and exploited from the current or committed installations. The size of this area is determined by the environmental permits obtained and varies depending on the commodity under consideration; the attitude (horizontal, inclined, vertical); the type, extent, and number of the deposit(s); and the mining method(s) in use.

[6] For further analysis of 2007 exploration and deposit appraisal expenditures and a discussion of 2008 spending intentions, including more project-related information, see "Mineral Exploration, Deposit Appraisal, and Mine Complex Development Activity in Canada" in the 2007 edition of the *Canadian Minerals Yearbook*, Natural Resources Canada, Ottawa.

Figure 1
Project Operators Active in Exploration and Deposit Appraisal in Canada, 1997-2008



Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
Notes: Data exclude prospectors and prospector groups. Data up to and including 2007 are final; 2008 data are based on revised company spending intentions and are current as of December 2008.

number of companies represented a 9.6% increase from the 2006 total of 768 companies (expenditures of $1906 million) and a further increase from the low of 504 project operators that was recorded in 2000. A total of 417 companies (compared to 318 in 2006 and 231 in 2005) spent more than $1 million each in 2007; these companies' expenditures accounted for 95% of the total expenditures for that year. Although projects receiving more than $1 million in spending usually account for 80% or more of total yearly expenditures, the upward trend in spending that continued unabated in 2007 has been marked by increasing investments on a per-project basis (notwithstanding inflation in exploration costs resulting from a limited availability of equipment and services).

After increasing by 46% between 2005 and 2006, exploration and deposit appraisal expenditures jumped by another 48% (+$919 million) between 2006 and 2007. All provinces and territories except Alberta contributed to this important increase (**Figure 2** and **Table 2**). In dollar terms, Ontario (+$225 million), Québec (+$181 million), Nunavut (+$127 million), and British Columbia (+$126 million) recorded the largest increases over 2006. Ontario ($572 million), Québec ($476 million), British Columbia ($471 million), Nunavut ($338 million), and Saskatchewan ($314 million) all recorded spending above the $300 million mark. Together these five jurisdictions accounted for 77% of total spending in 2007.

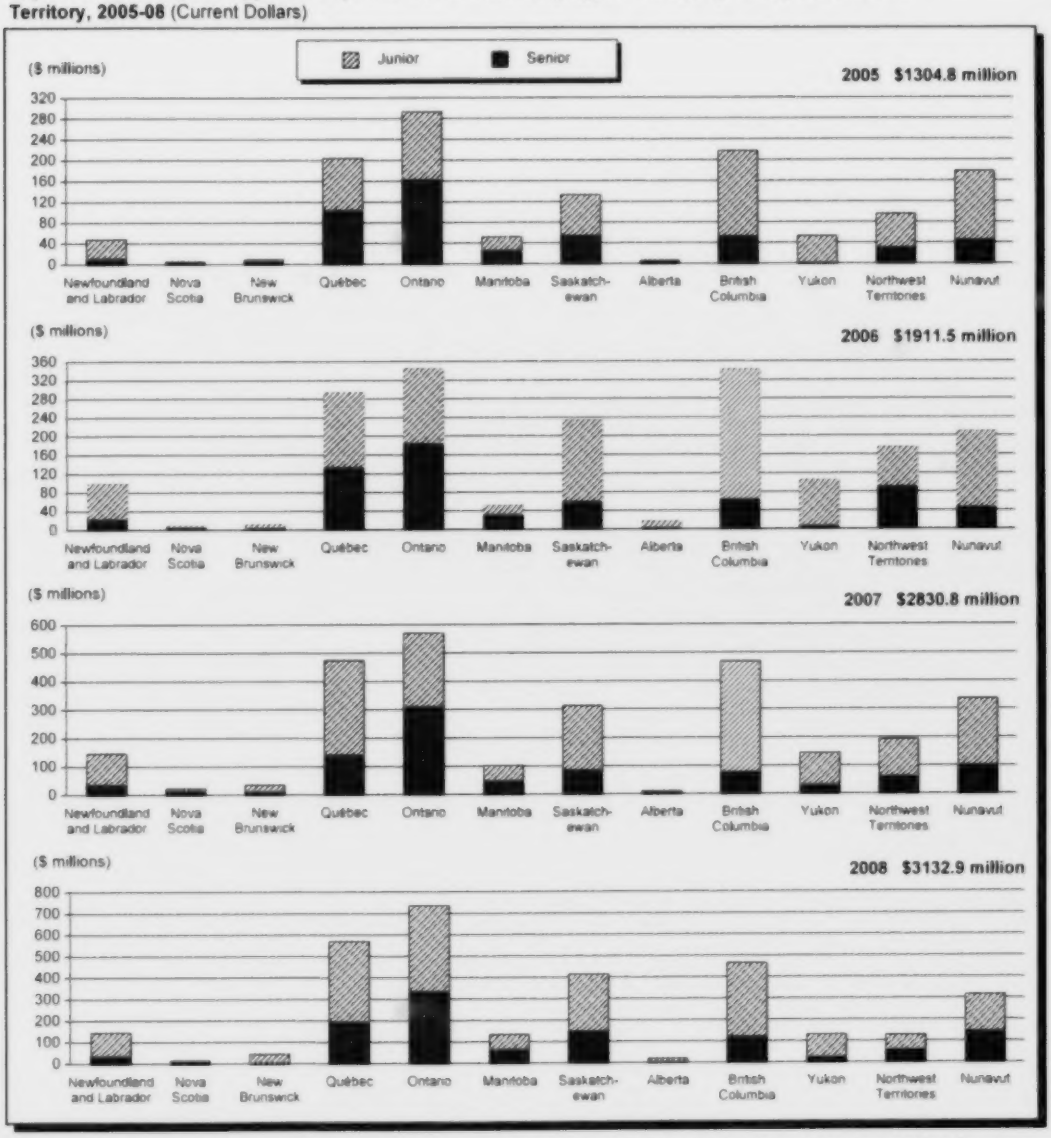
Expenditures for off-mine-site exploration and deposit appraisal activity increased by 49% (to $2638 million) from the 2006 level of $1769 million (**Figure 3a**). In constant 2007 dollars, this was the seventh consecutive increase in off-mine-site spending (**Figure 3b**). Overall, 93% of all exploration and deposit appraisal expenditures in 2007 was for off-mine-site activity. The main component of off-mine-site spending, the off-mine-site exploration work phase, has been on a strong increasing trend since 2000. The top three jurisdictions in terms of 2007 off-mine-site exploration spending were Québec ($452 million), British Columbia ($452 million), and Ontario ($447 million). Together these three provinces accounted for just over half (51%) of total off-mine-site exploration spending in Canada for that year (**Figure 4**).

TABLE 1. EXPLORATION AND DEPOSIT APPRAISAL EXPENDITURES IN CANADA, (1) BY RANGE OF EXPENDITURES AND BY TYPE OF COMPANY (PROJECT OPERATORS), 2005-08 (Current Dollars)

	Junior			Senior			Total		
Range of Expenditures	Companies (Project Operators)	Expenditures	Percentage of Total Expenditures	Companies (Project Operators)	Expenditures	Percentage of Total Expenditures	Companies (Project Operators)	Expenditures	Percentage of Total Expenditures
($)	(no.)	($000)	(%)	(no.)	($000)	(%)	(no.)	($000)	(%)
2005									
>10 million	13	238 275	29.7	15	338 015	67.1	28	576 290	44.2
5 million-10 million	18	124 974	15.6	15	93 467	18.6	33	218 441	16.7
1 million-5 million	148	311 358	38.9	22	60 955	12.1	170	372 314	28.5
500 000-1 million	99	71 285	8.9	10	7 095	1.4	109	78 381	6.0
200 000-500 000	111	36 125	4.5	7	2 495	0.5	118	38 621	2.9
100 000-200 000	70	9 973	1.2	6	722	0.1	76	10 696	0.8
50 000-100 000	59	4 075	0.5	5	369	0.1	64	4 444	0.3
1-50 000	124	2 399	0.3	20	384	0.1	144	2 783	0.2
Subtotal	642	798 466	99.6	100	503 503	100.0	742	1 301 969	99.8
Prospectors (2)	11	2 821	0.4	–	–	–	11	2 821	0.2
Total 2005	653	801 287	100.0	100	503 503	100.0	753	1 304 790	100.0
2006									
>10 million	20	428 611	34.6	20	477 257	70.9	40	905 868	47.4
5 million-10 million	35	247 745	20.0	15	114 204	17.0	51	361 949	18.9
1 million-5 million	202	438 012	35.4	25	71 308	10.6	227	509 320	26.6
500 000-1 million	96	69 404	5.6	5	4 066	0.6	101	73 470	3.8
200 000-500 000	99	34 444	2.8	11	3 813	0.6	110	38 257	2.0
100 000-200 000	63	9 532	0.8	14	1 884	0.3	77	11 417	0.6
50 000-100 000	44	3 331	0.3	7	541	0.1	51	3 871	0.2
1-50 000	89	1 517	0.1	22	424	0.1	111	1 941	0.1
Subtotal	649	1 232 596	99.6	119	673 497	100.0	768	1 906 093	99.7
Prospectors (2)	13	5 434	0.4	–	–	–	13	5 434	0.3
Total 2006	662	1 238 031	100.0	119	673 497	100.0	781	1 911 527	100.0
2007									
>10 million	36	773 400	40.6	29	738 140	79.7	65	1 511 540	53.4
5 million-10 million	62	428 131	22.5	14	98 343	10.6	76	526 474	18.6
1 million-5 million	244	583 013	30.6	32	77 453	8.4	276	660 466	23.3
500 000-1 million	101	73 716	3.9	8	5 641	0.6	109	79 357	2.8
200 000-500 000	90	29 111	1.5	13	4 284	0.5	103	33 396	1.2
100 000-200 000	46	6 177	0.3	14	1 996	0.2	60	8 172	0.3
50 000-100 000	38	2 550	0.1	5	382	–	43	2 931	0.1
1-50 000	91	1 906	0.1	19	218	–	110	2 124	0.1
Subtotal	708	1 898 003	99.7	134	926 456	100.0	842	2 824 460	99.8
Prospectors (2)	9	6 359	0.3	–	–	–	9	6 359	0.2
Total 2007	717	1 904 362	100.0	134	926 456	100.0	851	2 830 819	100.0
2008									
>10 million	50	916 999	46.2	28	906 768	79.1	78	1 823 767	58.2
5 million-10 million	57	382 304	19.2	18	122 798	10.7	75	505 103	16.1
1 million-5 million	268	586 692	29.5	40	104 297	9.1	308	690 988	22.1
500 000-1 million	97	64 145	3.2	14	9 116	0.8	111	73 261	2.3
200 000-500 000	86	26 077	1.3	8	2 614	0.2	94	28 690	0.9
100 000-200 000	35	4 441	0.2	5	635	0.1	40	5 076	0.2
50 000-100 000	31	1 866	0.1	8	515	–	39	2 381	0.1
1-50 000	45	773	–	10	166	–	55	939	–
Subtotal	669	1 983 297	99.9	131	1 146 908	100.0	800	3 130 206	99.9
Prospectors (2)	9	2 735	0.1	–	–	–	9	2 735	0.1
Total 2008 (rsi)	678	1 986 033	100.0	131	1 146 908	100.0	809	3 132 941	100.0

Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
– Nil; (rsi) Revised spending intentions.
(1) Includes on-mine-site plus off-mine-site activities. Includes field work, overhead, engineering, economic and pre- or production feasibility studies, environment and land access costs. (2) The number of prospectors is underestimated because it contains groups of prospectors.
Notes: Numbers may not add to totals due to rounding. Data up to and including 2007 are final; 2008 data are based on revised company spending intentions and are current as of December 2008.

Figure 2
Exploration and Deposit Appraisal Expenditures in Canada, by Type of Company and by Province and Territory, 2005-08 (Current Dollars)



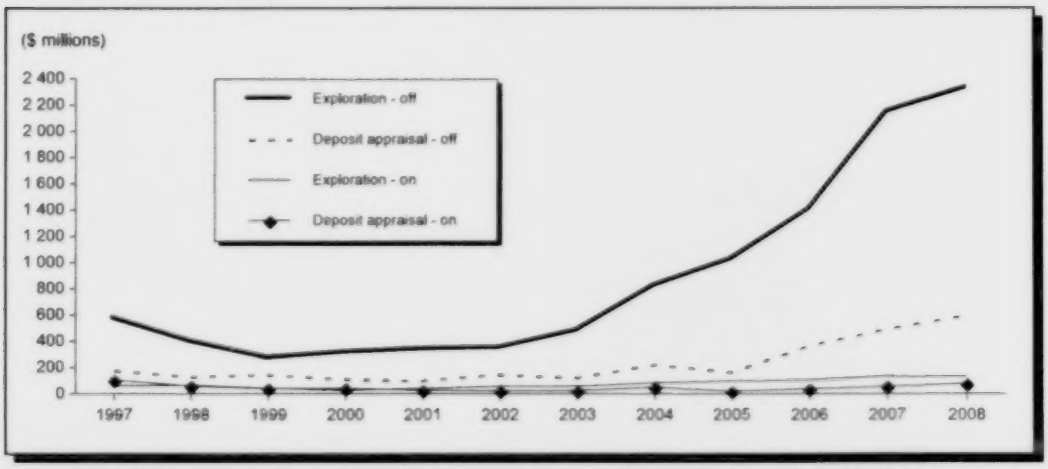
Sources: Natural Resources Canada and Statistics Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
Notes: Exploration and deposit appraisal activities include only the search for and appraisal of new deposits; they do not include work for extensions of deposits already being mined or committed to production. Exploration and deposit appraisal expenditures include off-mine-site and on-mine-site costs incurred for field work and overhead, plus engineering, economic and feasibility studies, environment and land access costs. Data up to and including 2007 are final. 2008 data are based on revised company spending intentions and are current as of December 2008.

TABLE 2. EXPLORATION AND DEPOSIT APPRAISAL EXPENDITURES IN CANADA, BY PROVINCE AND TERRITORY, 2005-08 (Current Dollars)

Province/Territory	2005		2006		2007		2008 (rsi)	
	($000)	(%)	($000)	(%)	($000)	(%)	($000)	(%)
Newfoundland and Labrador	48.7	3.7	100.8	5.3	148.0	5.2	147.8	4.7
Nova Scotia	6.5	0.5	11.0	0.6	23.5	0.8	15.1	0.5
New Brunswick	10.1	0.8	13.4	0.7	35.8	1.3	46.2	1.5
Québec	205.1	15.7	295.1	15.4	476.4	16.8	571.0	18.2
Ontario	294.0	22.5	346.5	18.1	571.7	20.2	737.5	23.5
Manitoba	52.9	4.1	52.9	2.8	102.6	3.6	135.8	4.3
Saskatchewan	133.9	10.3	235.6	12.3	314.0	11.1	415.7	13.3
Alberta	6.6	0.5	19.7	1.0	11.8	0.4	20.5	0.7
British Columbia	218.1	16.7	344.2	18.0	470.6	16.6	466.5	14.9
Yukon	54.0	4.1	106.4	5.6	144.7	5.1	131.1	4.2
Northwest Territories	96.3	7.4	176.2	9.2	193.7	6.8	128.7	4.1
Nunavut	178.7	13.7	210.6	11.0	338.0	11.9	317.0	10.1
Total	1 304.8	100.0	1 911.5	100.0	2 830.8	100.0	3 132.9	100.0
Exploration	1 119.9	85.8	1 503.7	78.7	2 274.3	80.3	2 456.5	78.4
Deposit appraisal	184.9	14.2	407.9	21.3	556.6	19.7	676.5	21.6

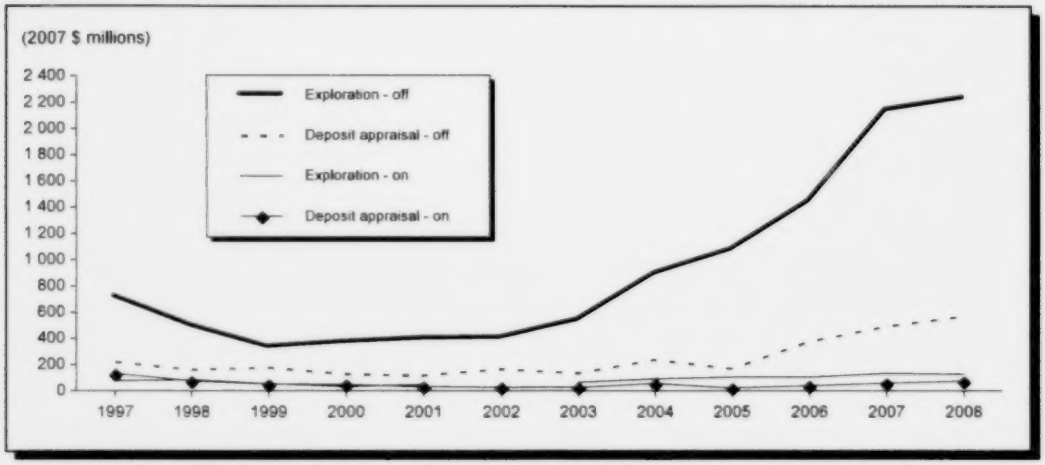
Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
(rsi) Revised spending intentions.
Notes: Data up to and including 2007 are final; 2008 data are based on revised spending intentions and are current as of December 2008. Exploration and deposit appraisal expenditures include off-mine-site and on-mine-site costs incurred for field work and overhead, plus engineering, economic and feasibility studies, environment and land access costs. Numbers may not add to totals due to rounding.

Figure 3a
On-Mine-Site and Off-Mine-Site Exploration and Deposit Appraisal Expenditures (1) **in Canada, 1997-2008** (Current Dollars)



Source: Natural Resources Canada, based on Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
(1) On-mine-site and off-mine-site exploration and deposit appraisal expenditures include field work and overhead costs, plus engineering, economic and feasibility studies, environment and land access costs.
Note: Data up to and including 2007 are final; 2008 data are based on revised company spending intentions and are current as of December 2008.

Figure 3b
On-Mine-Site and Off-Mine-Site Exploration and Deposit Appraisal Expenditures (1) **in Canada, 1997-2008** (Constant Dollars)



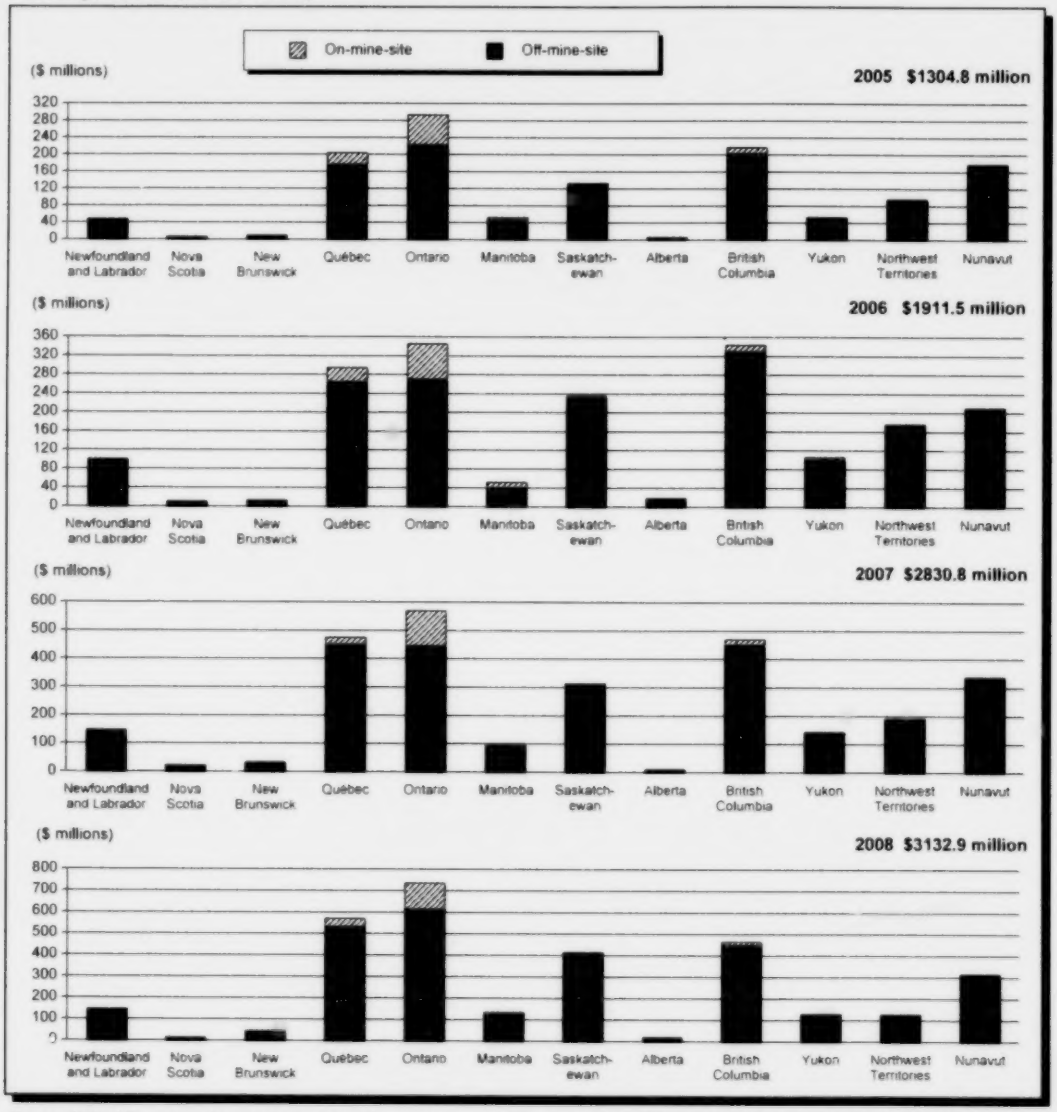
Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
(1) On-mine-site and off-mine-site exploration and deposit appraisal expenditures include field work and overhead costs, plus engineering, economic and feasibility studies, environment and land access costs.
Note: Data up to and including 2007 are final; 2008 data are based on revised company spending intentions and are current as of December 2008.

Once again, on-mine-site exploration and deposit appraisal spending failed to match the growing trend in off-mine-site expenditures. This type of spending amounted to $193 million in 2007. This total remains below the more robust on-mine-site spending that took place in 1997, the first year of the current survey format, when this type of spending amounted to $211 million in constant 2007 dollars (**Figure 3b**). On-mine-site spending totals are based on a smaller number of projects and tend to fluctuate more widely as projects are dropped or moved to a later stage of the mineral resource development cycle (sometimes in a relatively short time frame). This has certainly been the case in this period of intense activity where more expenditures have been recorded in the mine complex development category (**Table 3**). Still, the apparent lack of effort for on-mine-site exploration and deposit appraisal in a period of strong metal prices underlines the seriousness of the issue of declining reserves (**Table 4**), which are still at relatively low levels despite some commodity-specific improvements in 2007.[7]

Ontario and Manitoba recorded the highest proportion of on-mine-site spending with 22% and 8%, respectively, of their total exploration and deposit appraisal expenditures. In dollar terms, the bulk of on-mine-site spending in Canada in 2007 occurred in Ontario with $125 million. Québec was a distant second with $25 million, and British Columbia and Manitoba recorded totals of $19 million and $9 million, respectively.

[7] For a discussion on the state of Canada's ore reserves, see "Canadian Reserves of Selected Major Metals, and Recent Production Decisions" in the 2007 edition of the *Canadian Minerals Yearbook*, Natural Resources Canada, Ottawa.

Figure 4
On-Mine-Site and Off-Mine-Site Exploration and Deposit Appraisal Expenditures in Canada, by Province and Territory, 2005-08 (Current Dollars)



Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
Notes: Exploration and deposit appraisal activities include only the search for and appraisal of new deposits; they do not include work for extensions of deposits already being mined or committed to production. Exploration and deposit appraisal expenditures include off-mine-site and on-mine-site costs incurred for field work and overhead, plus engineering, economic and feasibility studies, environment and land access costs. Data up to and including 2007 are final; 2008 data are based on revised company spending intentions and are current as of December 2008.

TABLE 3. EXPLORATION, DEPOSIT APPRAISAL AND MINE COMPLEX DEVELOPMENT EXPENDITURES IN CANADA, (1) 2006 AND 2007
(Current Dollars)

Expenditure Category	Exploration		Deposit Appraisal		Exploration Plus Deposit Appraisal		Mine Complex Development		Grand Total	
	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007
	($000)									
Field work and overhead (2)	1 433 671	2 144 197	236 176	376 788	1 669 846	2 520 985	1 009 622	1 192 426	2 679 469	3 713 411
Engineering, economic and pre- or production feasibility studies	40 745	87 353	127 152	121 631	167 898	208 985	48 031	76 498	215 928	285 483
Environment	27 397	36 384	41 322	53 765	68 718	90 149	77 314	93 152	146 032	183 301
Land access	1 867	6 321	3 198	4 379	5 065	10 700	13 565	4 485	18 630	15 185
Subtotal	1 503 680	2 274 255	407 847	556 564	1 911 527	2 830 819	1 148 532	1 366 561	3 060 059	4 197 380
Off-mine-site (3)	1 400 118	2 141 163	368 690	496 378	1 768 808	2 637 541	n.a.	n.a.	1 768 808	2 637 541
On-mine-site (3)	103 562	133 092	39 157	60 186	142 719	193 278	1 148 532	1 366 561	1 291 251	1 559 839
Capital (4)	32 992	70 751	85 457	411 444	118 450	482 196	3 188 467	3 985 970	3 306 916	4 468 166
$ for environmental protection and restoration (5)	502	2 201	–	835	502	3 036	24 973	53 001	25 475	56 036
Total	1 536 672	2 345 006	493 304	968 008	2 029 977	3 313 015	4 336 999	5 352 531	6 366 975	8 665 546
Repair and maintenance (4)	5 995	8 234	20 189	13 094	26 184	21 328	1 527 738	1 805 792	1 553 923	1 827 120
$ for environmental protection and restoration (5)	1 204	20	95	38 650	1 299	38 670	17 634	17 704	18 933	56 373
Grand total	1 542 668	2 353 240	513 493	981 102	2 056 161	3 334 342	5 864 737	7 158 324	7 920 898	10 492 666
Total environment	29 103	38 605	41 417	93 250	70 519	131 855	119 920	163 856	190 440	295 711
Environment as a percentage of grand total	1.9	1.6	8.1	9.5	3.4	4.0	2.0	2.3	2.4	2.8

Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
– Nil; n.a. Not applicable.
(1) Includes on-mine-site plus off-mine-site activities; exploration and deposit appraisal activities include only the search for and appraisal of deposits and do not include work for extensions of known reserves. (2) Overhead expenditures include mineral leases and claims, and project-related head office expenditures. (3) Amount of exploration and deposit appraisal expenditures dedicated to off-mine-site and on-mine-site activities. (4) Includes construction, and machinery and equipment expenditures. (5) As part of capital expenditures or repair and maintenance expenditures.
Notes: Numbers may not add to totals due to rounding. Data for 2006 and 2007 are final.

TABLE 4. CANADIAN RESERVES OF SELECTED MAJOR METALS AS AT DECEMBER 31 OF EACH YEAR, 1977-2007

Metal Contained in Proven and Probable Mineable Ore (1) in Operating Mines (2) and Deposits Committed to Production

Year	Copper	Nickel	Lead	Zinc	Molybdenum	Silver	Gold (3)
	(000 t)	(000 t)	(000 t)	(000 t)	(000 t)	(t)	(t)
1977	16 914	7 749	8 954	26 953	369	30 991	493
1978	16 184	7 843	8 930	26 721	464	30 995	505
1979	16 721	7 947	8 992	26 581	549	32 124	575
1980	16 714	8 348	9 637	27 742	551	33 804	826
1981	15 511	7 781	9 380	26 833	505	32 092	851
1982	16 889	7 546	9 139	26 216	469	31 204	833
1983	16 214	7 393	9 081	26 313	442	31 425	1 172
1984	15 530	7 191	9 180	26 000	361	30 757	1 208
1985	14 201	7 041	8 503	24 553	331	29 442	1 373
1986	12 918	6 780	7 599	22 936	312	25 914	1 507
1987	12 927	6 562	7 129	21 471	231	25 103	1 705
1988	12 485	6 286	6 811	20 710	208	26 122	1 801
1989	12 082	6 092	6 717	20 479	207	24 393	1 645
1990	11 261	5 776	5 643	17 847	198	20 102	1 542
1991	11 040	5 691	4 957	16 038	186	17 859	1 433
1992	10 755	5 605	4 328	14 584	163	15 974	1 345
1993	9 740	5 409	4 149	14 206	161	15 576	1 333
1994	9 533	5 334	3 861	14 514	148	19 146	1 513
1995	9 250	5 832	3 660	14 712	129	19 073	1 540
1996	9 667	5 623	3 450	13 660	144	18 911	1 724
1997	9 032	5 122	2 344	10 588	149	16 697	1 510
1998	8 402	5 683	1 845	10 159	121	15 738	1 415
1999	7 761	4 983	1 586	10 210	119	15 368	1 326
2000	7 419	4 782	1 315	8 876	97	13 919	1 142
2001	6 666	4 335	970	7 808	95	12 593	1 070
2002	6 774	4 920	872	6 871	82	11 230	1 023
2003	6 037	4 303	749	6 251	78	9 245	1 009
2004	5 546	3 846	667	5 299	80	6 568	787
2005	6 589	3 960	552	5 063	95	6 684	965
2006	6 923	3 940	737	6 055	101	6 873	1 032
2007	7 565	3 778	682	5 984	213	6 588	987

Source: Natural Resources Canada, based on company reports and the Federal-Provincial/Territorial Survey of Mines and Concentrators.

(1) No allowance is made for losses in milling, smelting and refining. Excludes material classified as "resources."

(2) Includes metal in mines where production has been suspended temporarily. (3) Excludes metal in placer deposits because reserves data are generally unavailable.

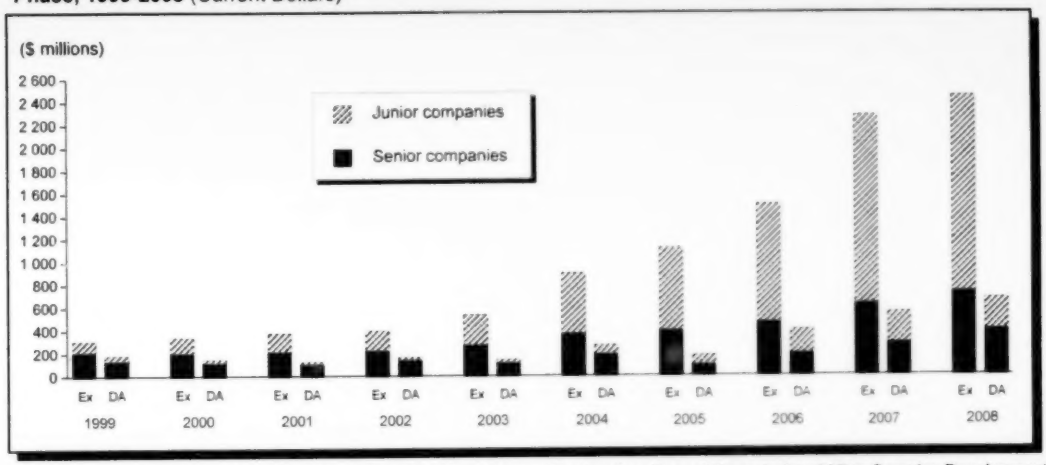
Note: One tonne (t) = 1.1023113 short tons = 32 150.746 troy oz.

1.3.1.2 Spending by Work Phase

A breakdown of spending by work phase (exploration and deposit appraisal) shows that expenditures dedicated to the exploration work phase grew again in 2007. This type of expenditure rose by another 51% to reach $2274 million (80% of total exploration and deposit appraisal spending for the year). Spending on the deposit appraisal work phase increased to $557 million, a 36% increase from the $408 million recorded in 2006 (**Figures 5a** and **5b**, **Table 3**). Along with increasing deposit appraisal spending, other indicators (such as average spending per project and the types of work undertaken and described on survey questionnaires) point to a growing portion of exploration-phase work occurring close to the margin separating the exploration phase from the deposit appraisal phase.

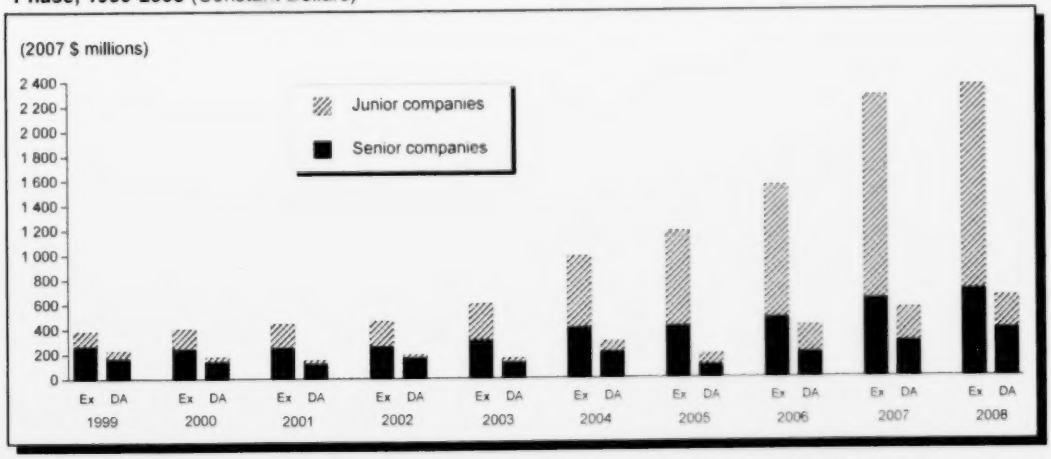
Off-mine-site spending of $2141 million represented 94% of total spending in the exploration work phase in 2007 (**Figure 3a**). Over the period 1997-2007, off-mine-site spending has consistently represented over 85% of total exploration-phase expenditures (**Figure 3b**). In terms of deposit appraisal expenditures, approximately 90% of the $557 million recorded for off- and on-mine-site deposit appraisal activities in 2007 was reported as off-mine-site spending.

Figure 5a
Exploration and Deposit Appraisal Expenditures in Canada, by Type of Company and by Work Phase, 1999-2008 (Current Dollars)



Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
Ex Exploration; DA Deposit appraisal.
Notes: Exploration and deposit appraisal expenditures include off-mine-site and on-mine-site field and overhead expenditures, plus engineering, economic and feasibility studies, environment and land access costs. Data up to and including 2007 are final; 2008 data are based on revised company spending intentions and are current as of December 20008.

Figure 5b
Exploration and Deposit Appraisal Expenditures in Canada, by Type of Company and by Work Phase, 1999-2008 (Constant Dollars)



Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
Ex Exploration; DA Deposit appraisal.
Notes: Exploration and deposit appraisal expenditures include off-mine-site and on-mine-site field and overhead expenditures, plus engineering, economic and feasibility studies, environment and land access costs. Data up to and including 2007 are final; 2008 data are based on revised company spending intentions and are current as of December 2008.

A provincial/territorial breakdown of exploration and deposit appraisal expenditures for 2007 reveals that all Canadian mining jurisdictions recorded greater spending on exploration-type work than they did for deposit appraisal activities (**Figure 6**). In Saskatchewan, New Brunswick, and Manitoba, virtually all of the work was reported as exploration-phase while Nova Scotia (41%) and Alberta (36%) reported the highest proportions of deposit appraisal spending.

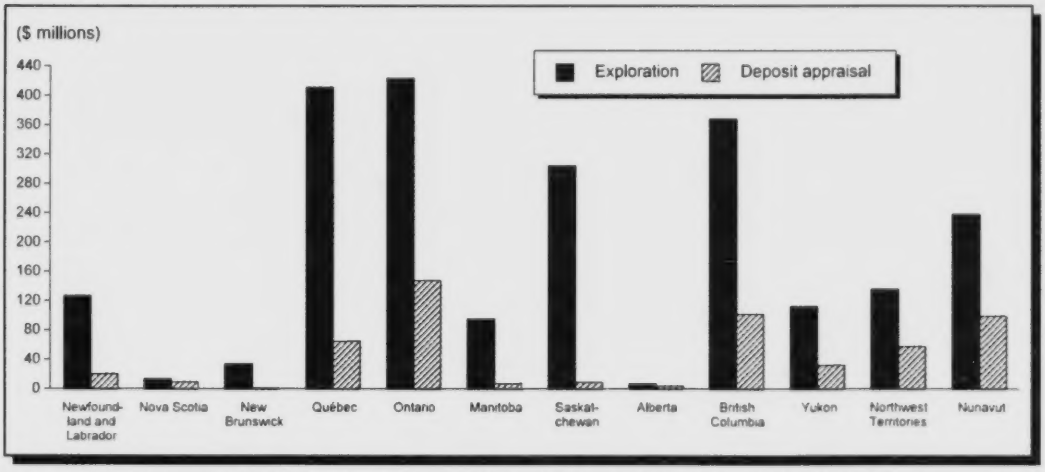
In terms of ranking by total exploration expenditures, Ontario ranked first with $424 million, followed by Québec ($412 million), British Columbia ($369 million), Saskatchewan ($305 million), and Nunavut ($238 million). Together these five jurisdictions accounted for 77% of all exploration-phase expenditures in Canada in 2007.

For deposit appraisal, the leaders in dollar terms were Ontario ($148 million), British Columbia ($102 million), Nunavut ($100 million), Québec ($65 million), and the Northwest Territories ($58 million).

1.3.1.3 Spending by Type of Activity

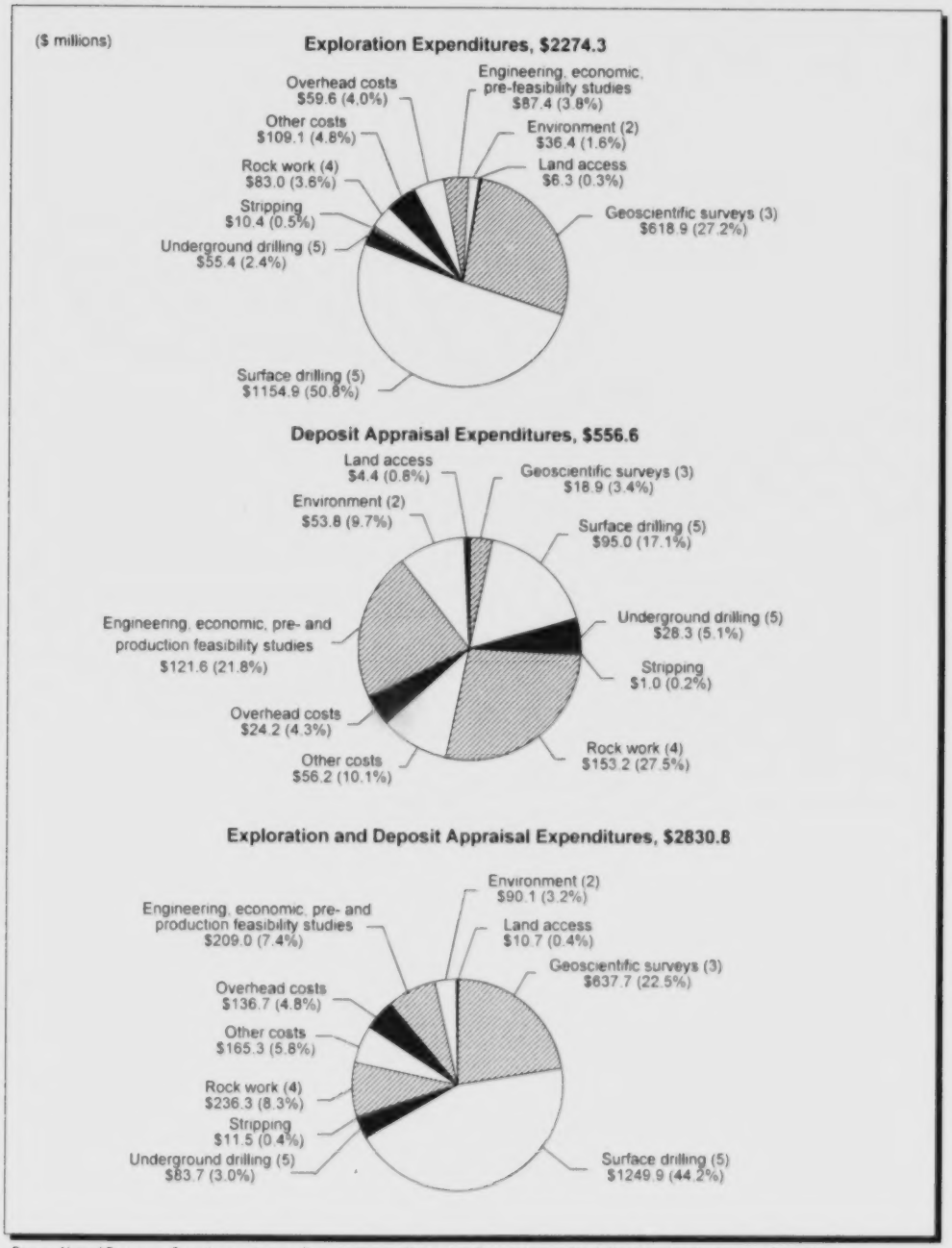
A detailed cost breakdown for each of the exploration and deposit appraisal work phases confirms that drilling (surface and underground) is the most important cost component in the discovery and delineation of a mineral deposit (**Figure 7**). In 2007, surface and underground drilling (diamond drilling and other types of drilling) accounted for 53% ($1210 million) of the $2274 million spent on the exploration work phase. As can be expected, surface drilling accounted for the vast majority of exploration-related drilling activity with 95% of the $1210 million spent on such work. Geoscientific surveys (geology, geochemistry, and geophysics) represent the other important cost component in that work phase. In 2007, 27% ($619 million) of all exploration-phase spending was recorded under the geoscientific surveys cost category.

Figure 6
Exploration and Deposit Appraisal Expenditures in Canada, by Province and Territory, 2007
(Current Dollars)



Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
Notes: Exploration and deposit appraisal expenditures include off-mine-site and on-mine-site field and overhead expenditures, plus engineering, economic and feasibility studies, environment and land access costs. Data for 2007 are final.

Figure 7
Exploration and Deposit Appraisal Expenditures in Canada, (1) by Type of Work, 2007
(Current Dollars)


($ millions)
Exploration Expenditures, $2274.3
Overhead costs $59.6 (4.0%)
Engineering, economic, pre-feasibility studies $87.4 (3.8%)
Other costs $109.1 (4.8%)
Environment (2) $36.4 (1.6%)
Rock work (4) $83.0 (3.6%)
Land access $6.3 (0.3%)
Stripping $10.4 (0.5%)
Geoscientific surveys (3) $618.9 (27.2%)
Underground drilling (5) $55.4 (2.4%)
Surface drilling (5) $1154.9 (50.8%)
Deposit Appraisal Expenditures, $556.6
Land access $4.4 (0.8%)
Geoscientific surveys (3) $18.9 (3.4%)
Environment (2) $53.8 (9.7%)
Surface drilling (5) $95.0 (17.1%)
Engineering, economic, pre- and production feasibility studies $121.6 (21.8%)
Underground drilling (5) $28.3 (5.1%)
Stripping $1.0 (0.2%)
Overhead costs $24.2 (4.3%)
Rock work (4) $153.2 (27.5%)
Other costs $56.2 (10.1%)
Exploration and Deposit Appraisal Expenditures, $2830.8
Environment (2) $90.1 (3.2%)
Engineering, economic, pre- and production feasibility studies $209.0 (7.4%)
Land access $10.7 (0.4%)
Geoscientific surveys (3) $637.7 (22.5%)
Overhead costs $136.7 (4.8%)
Other costs $165.3 (5.8%)
Rock work (4) $236.3 (8.3%)
Stripping $11.5 (0.4%)
Underground drilling (5) $83.7 (3.0%)
Surface drilling (5) $1249.9 (44.2%)

Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
(1) Includes on-mine-site plus off-mine-site activities. (2) Environment includes characterization, permitting, protection, monitoring, and restoration. (3) Geoscientific surveys include geology, geochemistry, ground geophysics, and airborne geophysics. (4) Rock work activity includes shaft work, drifts, cross-cuts, raises, declines, and dewatering costs. (5) Drilling includes diamond and other types of drilling.
Notes: Data for 2007 are final.

In the deposit appraisal phase, surface and underground drilling accounted for 22% ($123 million) of the total $557 million spent in 2007. The rock work category (28%, $153 million) and the engineering, economic, pre- and production feasibility studies category (22%, $122 million) are the other major cost components in that work phase.

Overall, surface and underground drilling accounted for 47% ($1334 million) of all exploration and deposit appraisal spending in 2007 while geoscientific surveys ranked second with 23% ($638 million).

Among the other cost categories included in the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures, the categories of environment and land access can be of interest to various stakeholder groups, including non-governmental organizations, industry associations, and Aboriginal communities.

In 2007, a total of $90 million was reported by survey respondents as environment-related expenditures, which include costs incurred for characterization, permitting, protection, monitoring, and restoration. This total represents 3.2% of all exploration and deposit appraisal expenditures reported for that year. These environment-related expenditures were split approximately 60%-40% in favour of the deposit appraisal phase, a distribution reflecting the increasing importance of such work in projects moving forward in the mineral development spectrum. For instance, environment-related costs (including capital, repair and maintenance) in the mine complex development category amounted to $164 million in 2007 (**Table 3**).

Similar to environmental costs, land access costs (which include costs incurred for impact and benefits agreements, socio-economic agreements, rights of way, damages, and permits, but do not include acquisition costs) only account for a small fraction of total exploration and deposit appraisal expenditures. In 2007, these costs represented only 0.4% ($11 million) of total exploration and deposit appraisal expenditures. However, land access costs can increase subtantially at the mine complex development stage and beyond as items such as impact and benefits agreements come into play.

Industry representations to obtain clarification of the tax treatment for community consultation (land access) and environmental costs indicate that these two cost categories may in fact be more substantial than what has been reported in the survey. This issue was studied by a sub-working group on taxation of the Intergovernmental Working Group on the Mineral Industry (IGWG) on behalf of Canada's Mines Ministers and addressed to industry's satisfaction in a September 2007 letter to the Prospectors and Developers Association of Canada from the Canada Revenue Agency. Hence, for the purposes of this publication, the reader should be aware that both environmental and land access costs may be underestimated.

1.3.1.4 Spending by Type of Company

The analyses within this report often distinguish between senior and junior companies. In general terms, a senior company derives its income from mining or other business ventures and can direct part of that income towards its exploration and deposit appraisal projects. Junior companies, on the other hand, usually have no regular source of income and must finance their projects through the issuance of shares.

In 2007, 134 senior project operators accounted for 33% ($926 million) of all exploration and deposit appraisal expenditures in Canada (**Figures 1** and **2**). Almost 70% of total senior spending was allocated to exploration activities with the remaining 30% going to deposit appraisal work (**Figure 5a**). The distribution of senior project operators by range of spending was once again skewed towards the higher spending intervals in 2007 with 75 senior project operators recording expenditures above the $1 million level and 29 of these falling in the more than $10 million category (**Table 1**). In fact, these 29 senior project operators averaged spending of $25.4 million. Ontario and

Nova Scotia were the only jurisdictions where senior expenditures surpassed junior ones. In Ontario, senior companies spent $312 million on exploration and deposit appraisal activities in 2007 (**Figure 2**).

The number of junior project operators reached 708 in 2007, a 9% increase from the 649 recorded in 2006 and a continuation of the increasing trend that began in 2001 (**Figure 1** and **Table 1**). Altogether, these junior companies (along with prospectors) spent $1904 million on exploration and deposit appraisal in 2007, a strong 54% increase over the $1238 million they spent in 2006. This was yet another significant improvement in junior company spending, a trait that has characterized this latest upward trend in total spending. Even when accounting for the time value of money, junior company exploration and deposit appraisal expenditures in 2007 were almost eleven times their 1999 value (**Figure 5b**).

Junior company expenditures amounted to an impressive $393 million in British Columbia in 2007. Large amounts of junior company spending were also recorded in Québec ($335 million), Ontario ($260 million), Nunavut ($237 million), and Saskatchewan ($228 million) (**Figure 2**). Together these five jurisdictions accounted for three-quarters (76%) of all junior spending in Canada in 2007.

For that same year, junior company spending most frequently fell in the $1 million-$5 million spending interval (**Table 1**). In fact, with 244 projects in the $1 million-$5 million range, 62 in the $5 million-$10 million range, and 36 with spending of more than $10 million, junior companies were clearly managing the vast majority of the larger exploration and deposit appraisal projects in Canada.

The continued growth and strong performance of Canada's junior mining sector coincided with exceptional market conditions across a broad range of commodities, the continued availability of federal and provincial/territorial incentives, and a receptive investment community providing the funds needed to sustain this intense period of activity.

1.3.1.5 Spending by Type of Commodity Sought

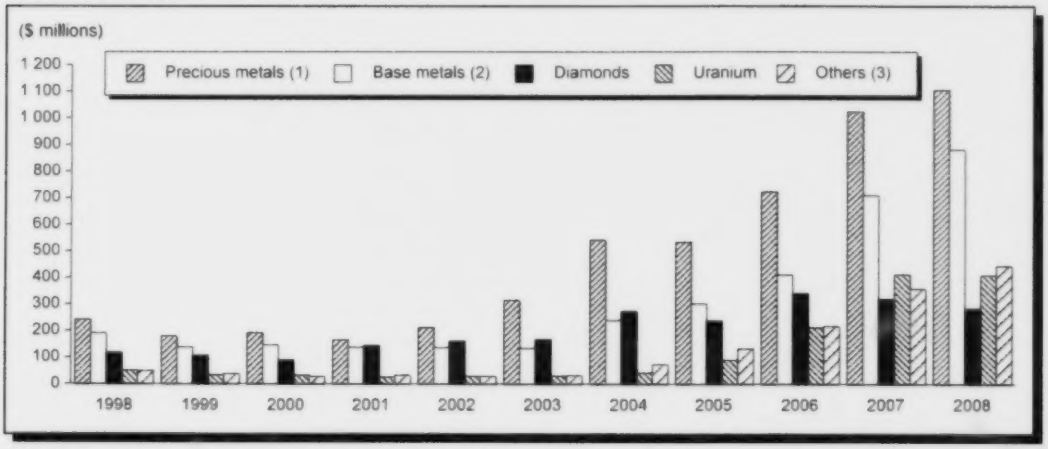
The federal-provincial/territorial survey provides a breakdown of exploration and deposit appraisal spending statistics by type of commodity sought. **Figure 8a** shows such a breakdown for the groups of commodities or individual commodities most explored for in Canada: precious metals, base metals, diamonds, uranium, and "others."

As a result of declining prices, exploration and deposit appraisal spending for precious metals (mostly gold) decreased significantly between 1997 and 2001. In constant 2007 dollars, precious-metals spending dropped from $508 million in 1997 to $196 million in 2001 (**Figure 8b**). For base metals, the downward trend was of an even longer duration. Starting with a 1997 total of $358 million (constant 2007 dollars), base-metal spending spiralled down to $154 million in 2003.

In 2002, precious-metals expenditures recovered somewhat by increasing to $248 million (constant 2007 dollars). As the result of an improving gold price outlook, precious-metals spending increased drastically in subsequent years to reach $357 million in 2003, $593 million in 2004, and $566 million in 2005 (all in constant 2007 dollars). Precious-metals spending increased to $747 million in 2006 and rose by a further 37% in 2007 to exceed the $1 billion threshold ($1025 million).

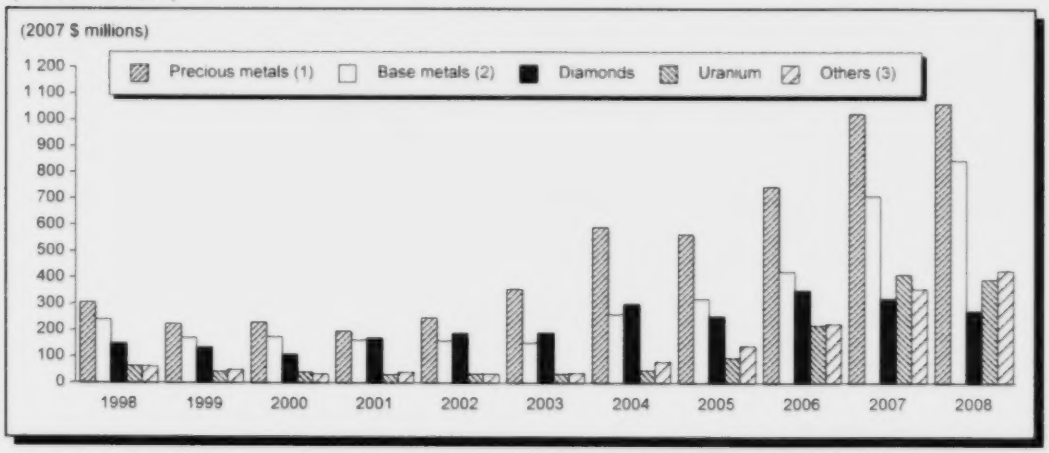
For base metals, a revamped exploration effort led to expenditures of $263 million in 2004, $321 million in 2005, and $425 million in 2006 (constant 2007 dollars). In response to the positive market outlook that prevailed at the time, base-metal exploration and deposit appraisal expenditures jumped by 68% to reach $711 million in 2007. As mentioned in previous editions of this report, Canada is facing a serious challenge in terms of declining base-metal reserves, and a renewed and sustained base-metal exploration effort will be needed to reverse that trend (**Table 4**).

Figure 8a
Exploration and Deposit Appraisal Expenditures in Canada, by Commodity Sought, 1998-2008
(Current Dollars)



Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
(1) Includes gold, silver, and platinum group metals. (2) Includes copper, nickel, lead, and zinc. (3) Includes ferrous metals, other metals, and nonmetals (including coal).
Notes: Exploration and deposit appraisal expenditures include off-mine-site and on-mine-site field and overhead expenditures, plus engineering, economic and feasibility studies, environment and land access costs. Data up to and including 2007 are final; 2008 data are based on revised company spending intentions and are current as of December 2008.

Figure 8b
Exploration and Deposit Appraisal Expenditures in Canada, by Commodity Sought, 1998-2008
(Constant Dollars)



Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
(1) Includes gold, silver, and platinum group metals. (2) Includes copper, nickel, lead, and zinc. (3) Includes ferrous metals, other metals, and nonmetals (including coal).
Notes: Exploration and deposit appraisal expenditures include off-mine-site and on-mine-site field and overhead expenditures, plus engineering, economic and feasibility studies, environment and land access costs. Data up to and including 2007 are final; 2008 data are based on revised company spending intentions and are current as of December 2008.

The search for diamonds continued to generate significant investments in 2007 with another $322 million dedicated to the discovery of the precious gems. In constant 2007 dollar terms, this amount was second only to the 2006 total of $353 million, which was the highest total recorded since the current survey format was adopted in 1997. In the period 1997-2007, the relatively young Canadian diamond industry has allocated more than $2.3 billion to exploration and deposit appraisal activities. These investments have been the foundation upon which this $1.5-$2.1 billion/year industry was built, making Canada the third-ranked producer in the world (by value of diamonds produced since 2003).

After more than doubling from 2004 to 2005, uranium expenditures increased by 129% in 2006 to reach $220 million (constant 2007 dollars). Buoyed by soaring uranium spot prices and worldwide energy supply concerns, the search for uranium in Canada resulted in expenditures of $413 million in 2007. In addition to the well-known Athabasca Basin in Saskatchewan, a number of other uranium plays caught the interest of explorationists trying to take advantage of this favourable uranium market. Regions of interest included the Central Mineral Belt in Newfoundland and Labrador, the Otish mountains in Québec, the Elliot Lake region and Sibley Basin, both in Ontario, the Wernecke Mountains in the Yukon, and the Thelon, Baker, and Hornby basins in the Northwest Territories and Nunavut.

In the "other" category, strong showings by the ferrous metals (iron ore in Nunavut, Newfoundland and Labrador, and Québec) and coal (in British Columbia) pushed spending for that commodity group to a 2006 peak of $226 million (constant 2007 dollars). In 2007, this high was shattered by a significant 59% increase (to $359 million) that was fueled not only by continued interest in iron ore, but also by the increasing attractiveness of commodities such as molybdenum, antimony, tungsten, cobalt, and potash.

A regional breakdown of where exploration and deposit appraisal activity for these different commodity groups was taking place in 2007 is shown in **Table 5**. For precious metals, the leading jurisdictions in terms of spending were Ontario ($338 million), Québec ($232 million), and British Columbia ($181 million). Nunavut's gold mining potential attracted a further $125 million in expenditures. Base-metal exploration and deposit appraisal work was concentrated in British Columbia ($164 million), Ontario ($162 million), and Québec ($112 million). As for diamonds, the Northwest Territories continued to be the main target ($123 million), but significant spending was also recorded in Saskatchewan ($85 million) and Nunavut ($56 million). As can be expected, the

TABLE 5. EXPLORATION AND DEPOSIT APPRAISAL EXPENDITURES IN CANADA, BY PROVINCE AND TERRITORY AND MINERAL COMMODITY SOUGHT, 2007

Province/Territory	Base Metals	Precious Metals	Iron	Uranium	Other Metals	Nonmetals (Excluding Diamonds)	Diamonds	Coal	Total
					($000)				
Newfoundland and Labrador	47 153	17 839	2 670	69 222	10 159	982	-	-	148 024
Nova Scotia	9 000	6 960	13	-	12	498	-	7 000	23 484
New Brunswick	12 027	7 987	1	4 973	9 263	1 511	-	33	35 797
Québec	111 977	232 294	29 143	70 882	3 999	1 199	26 891	-	476 375
Ontario	161 880	338 281	6	12 384	27 987	4 015	27 100	-	571 652
Manitoba	75 204	22 236	-	2 241	1 954	405	568	-	102 607
Saskatchewan	12 366	14 735	-	181 984	3 150	16 688	84 955	117	313 995
Alberta	-	-	5	4 237	230	-	3 161	4 198	11 832
British Columbia	164 375	180 743	83	1 477	96 069	5 091	-	22 782	470 619
Yukon	68 367	59 108	-	9 972	7 070	151	-	25	144 693
Northwest Territories	25 238	20 096	-	12 207	12 851	452	122 886	-	193 730
Nunavut	23 910	124 957	86 718	43 697	1 965	730	56 033	-	338 010
Canada	711 497	1 025 236	118 639	413 276	174 709	31 712	321 594	34 156	2 830 819

Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
-- Nil.
(1) Includes off-mine-site plus on-mine-site activities. Includes field work, overhead, engineering, economic and pre- or production feasibility studies, environmental and land access expenditures.
Notes: Numbers may not add to totals due to rounding. Data for 2007 are final.

search for uranium was most intense in Saskatchewan ($182 million). However, Québec ($71 million), Newfoundland and Labrador ($69 million), and Nunavut ($44 million) also drew the attention of companies interested in this commodity's future prospects. For the remaining commodities, special mention should be made of the $96 million spent in British Columbia for "other metals" (mainly molybdenum) and the $87 million spent in Nunavut for iron ore.

Table 6 combines information on both the types of companies conducting exploration and deposit appraisal activities and the types of commodities sought by these companies. In 2007, precious metals continued to be the favourite target of senior companies with total spending of $363 million ($131 million more than in 2006). Base metals were a clear second with expenditures of $291 million, an increase of $122 million over the previous year. During 2007, senior companies also increased their expenditures for the discovery of uranium to $83 million from $55 million in 2006. They spent $36 million less on diamonds, a situation that probably reflected the advanced stage of their projects rather than a weakening interest in new diamond discoveries.

Once again, junior companies clearly outspent senior companies by a significant margin for every single commodity group. In doing so, junior companies continued to show a preference for precious-metals (mostly gold) exploration and deposit appraisal. Their steadily increasing expenditures on the search for gold and platinum group metals (PGM) reached $662 million in 2007, an increase of 35% over the $492 million recorded in 2006. Junior companies also substantially increased their spending on the other commodity groups. For example, junior companies increased their expenditures on the search for base metals from $243 million in 2006 to $421 million in 2007, on the search for uranium from $159 million to $330 million, on the search for diamonds from $203 million to $219 million, and on the "others" category from $141 million to $273 million. With these impressive numbers, junior companies continued to be at the forefront of this historic period of intense exploration activity in Canada.

TABLE 6. EXPLORATION AND DEPOSIT APPRAISAL EXPENDITURES IN CANADA, (1) BY TYPE OF COMPANY AND MINERAL COMMODITY SOUGHT, 2005-07 (Current Dollars)

Type of Company	Base Metals	Precious Metals	Uranium	Diamonds	Others (2)	Total
			($000)			
2005						
Junior companies and prospectors	170 356	358 715	54 005	147 874	70 337	801 287
Senior companies	133 143	176 921	37 196	91 714	64 530	503 504
Total	303 499	535 635	91 201	239 587	134 868	1 304 790
2006						
Junior companies and prospectors	242 699	492 114	158 535	203 344	141 339	1 238 031
Senior companies	169 229	232 497	55 055	138 681	78 033	673 496
Total	411 928	724 611	213 590	342 025	219 373	1 911 527
2007						
Junior companies and prospectors	420 616	662 038	329 786	219 099	272 823	1 904 362
Senior companies	290 881	363 198	83 490	102 496	86 391	926 456
Total	711 497	1 025 236	413 276	321 594	359 214	2 830 819

Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
(1) Exploration and deposit appraisal expenditures include off-mine-site and on-mine-site costs incurred for field work and overhead, plus engineering, economic and feasibility studies, environment and land access costs. (2) Includes iron, other metals, coal, and other nonmetals.
Notes: Numbers may not add to totals due to rounding. Data up to and including 2007 are final.

1.3.2 2008 Exploration and Deposit Appraisal Expenditures

1.3.2.1 Statistical Summary

As explained in the opening paragraphs of this chapter, company spending intentions for 2008 were compiled between March and June of 2008 and were revised in December of the same year. While this approach yields more timely forecasts of exploration and deposit appraisal expenditures, it remains a less detailed survey exercise. For instance, data on spending by type of commodity and by type of work are not exhaustive enough in the 2008 revised spending intentions to be presented in this report. Rather, they will be available in the 2009 edition after results from the 2008 *Actual* survey have been released.

For 2008, revised company spending intentions reveal that 800 companies (project operators) intended to spend a record $3.1 billion ($3130 million) (**Figures 1** and **2**, **Table 1**). When prospectors and groups of prospectors are included, this total reaches $3133 million. The final amount of exploration and deposit appraisal spending for 2008 will be confirmed in the *Actual* survey that will be conducted in 2009. However, given the deterioration of economic conditions that took the world by storm in 2008, leading to drastically reduced demand for minerals and metals and, consequently, to much weaker commodity prices, it can be expected that the final spending totals for 2008 will be lower than predicted in both the original and revised spending intentions compilations. In fact, the spending intentions forecast for 2009 (currently being compiled) is expected to highlight a clear break in the upward trend that had charaterized mineral exploration and deposit appraisal expenditures in Canada since 2001. Therefore, when reading the following analysis, the reader is reminded that survey respondents may not have been able to fully gauge the impact of such rapidly changing economic conditions on their exploration projects and connected financing activities. In addition, the survey exercise itself, with its built-in time constraints, might not have fully captured the extent of the project operators' reaction to this fast-paced erosion of the minerals and metals market outlook.

The total of 800 project operators represents a 5% decrease from the 842 (expenditures of $2831 million when including prospectors) recorded in 2007. With junior mining companies being hit particularly hard by the current economic crisis and the likelihood that its repercussions will linger for some time in the minds of potential investors, 2007 can probably be considered a peak year in terms of the number of projects being worked on in Canada. On average, companies were planning to spend $3.9 million per project in 2008, an amount equal to 3.5 times the 2003 level of $1.1 million. Part of this increasing-investment-per-project trend can be explained by higher exploration costs resulting from the intensifying use of equipment and resources. However, it has also taken place in an environment conditioned by strong metal prices, interesting exploration results, generous incentive levels, and mining-friendly capital markets. The timing and combination of these favourable conditions have provided a strong impetus for companies to invest in and move some of their projects as far along the mineral development spectrum as possible. Once the next recovery begins, these advanced projects will be among the first to get renewed consideration as investors and lenders look for projects that are closer to production and revenue generation.

This commitment to serious exploration and deposit appraisal activity was again highlighted by the number of project operators with large exploration budgets. Revised company spending intentions indicate that a total of 461 companies (417 in 2007, 318 in 2006, 231 in 2005, and 187 in 2004) each intended to spend more than $1 million in 2008 (**Table 1**). These 461 companies expected to spend a total of $3020 million, or 96% of total intended expenditures for 2008. This $3020 million total also represents a 12% increase from the $2698 million spent on projects of $1 million or more in 2007.

Very large spending intentions (more than $10 million) used to be the appanage of senior companies. Starting in 2005, the two types of companies began to split almost equally the number of these large projects. In 2007, junior company project operators reported spending intentions of $10 million or more on 36 projects while senior companies managed 29 such projects. In 2008, the number of

junior project operators anticipating spending more than $10 million on a project increased to 50. These junior companies intended to spend an average of $18.3 million on such projects. Senior companies with projects costing over $10 million in 2008 numbered 28 at an average investment of $32.4 million each. Once again, junior companies totally dominated the other spending categories. Overall, 669 junior company project operators intended to spend $1983 million ($3.0 million per project) versus 131 senior company project operators intending to spend $1147 million (for a much higher $8.8 million per project). Although senior companies did spend more per project, the intensive activity reported by the pool of junior company project operators, and its ultimate degree of success (in terms of discoveries and increased mineral resources), will play a crucial role in determining the future of mining in Canada.

As opposed to the previous two years when exploration and deposit appraisal expenditures were increasing in virtually every Canadian jurisdiction, only six provinces were expecting their total spending to rise in 2008. Between them these six jurisdictions were predicted to contribute an additional $414 million to the Canadian total. Ontario, with an increase of $166 million (for an astounding total of $738 million), was expected to lead the way. Significant increases, in dollar terms, were also anticipated in Saskatchewan (+$102 million) and Québec (+$95 million) (**Figure 2** and **Table 2**). Despite small decreases in 2008, some provinces/territories were expected to continue attracting considerable amounts of exploration and deposit appraisal spending. This is the case for Newfoundland and Labrador ($148 million), British Columbia ($467 million), the Yukon ($131 million), and Nunavut ($317 million). Of the six provinces/territories that were expected to see their total spending decline in 2008, the Northwest Territories is the most notable with a predicted decline of $65 million, or 34% less than the $194 million it received in 2007.

In Ontario and Québec, these high levels of spending were to be distributed among many projects targeting a number of commodities (e.g., precious metals, base metals, diamonds, and uranium) and also to be relatively well balanced between junior and senior companies. In British Columbia, where spending was also well distributed among projects and commodities, including coal and porphyry deposits (copper and molydenum), the junior mining sector was definitely predominant. Of course, Saskatchewan remained at the forefront of the search for uranium, but potash and diamonds were also factors there. The latter continued to attract some interest in the Northwest Territories, but also in other jurisdictions such as Nunavut where gold, base metals, iron ore, and uranium were also sought and where senior companies have taken an interest in some of the advanced projects (e.g., Australia's Zinifex in the High Lake copper-zinc-silver-gold deposit, U.S.-based Newmont in the Hope Bay gold properties, and Agnico-Eagle in the Meadowbank gold project). Uranium has even been a factor in the exploration revival that has been taking place in the Yukon (where other non-traditional commodities such as tungsten and molybdenum have joined the more traditional gold, silver, zinc, and copper), and it has also been an important factor in Newfoundland and Labrador (along with iron and nickel in Labrador, and zinc, copper and gold on the Island) where exploration continues despite a three-year moratorium on uranium mining and development by the Nunatsiavut government to study the effects of uranium mining and to develop a land-use plan.

Revised company spending intentions indicate that off-mine-site exploration and deposit appraisal expenditures could reach almost $3 billion ($2923 million) in 2008. This 11% increase in off-mine-site spending represents yet another segment of the growing trend that has characterized this type of expenditure since the mineral exploration sector started its recovery in 2003 (**Figures 3a** and **3b**). Ontario (+$169 million), Saskatchewan (+$98 million), and Québec (+$82 million) are expected to experience the largest increases, in dollar terms, for that type of spending in 2008 (**Figure 4**).

Overall, off-mine-site spending is expected to account for 93% of total exploration and deposit appraisal expenditures in Canada in 2008. While this continued emphasis on off-mine-site exploration could lead to important new discoveries, resource upgrades, and the advancement of projects outside traditional mining camps, it does not help alleviate concerns about the depletion of ore reserves at producing mines nor does it indicate much immediate interest in finding new sources of ore on existing mine properties.

Ontario is once again expected to remain the undisputed leader amongst Canadian mining jurisdictions for on-mine-site exploration and deposit appraisal spending. The $122 million slated for on-mine-site work in that province in 2008 far outweighs the $38 million and $15 million that are respectively forecast for second- and third-ranked Québec and British Columbia.

1.3.2.2 Spending by Work Phase

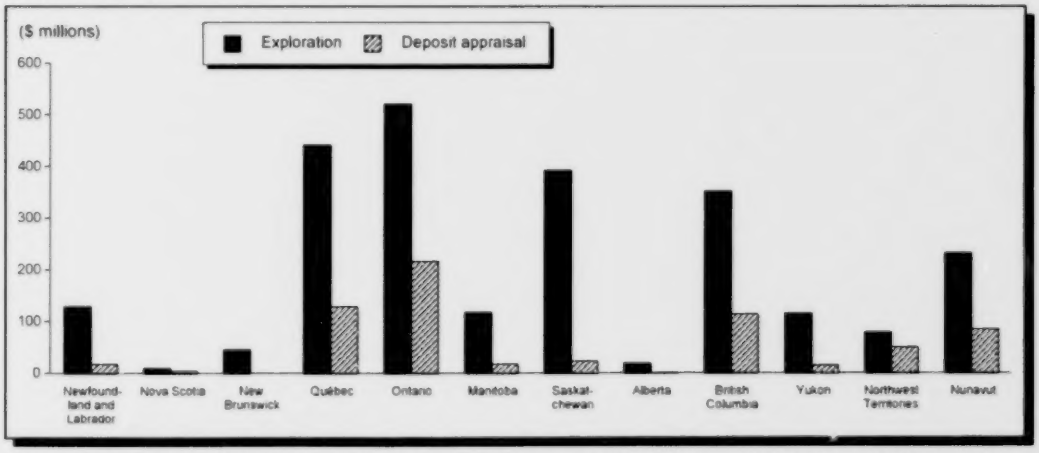
Revised company spending intentions indicate that expenditures dedicated solely to exploration activities will increase by 8% in 2008 to reach $2456 million (**Figures 5a** and **5b**). This amount represents 78% of total intended exploration and deposit appraisal expenditures for that year. Of this $2456 million total, $2325 million (95%) is expected to be spent off mine sites (**Figure 3a**).

As for deposit appraisal spending, it is expected to amount to $676 million in 2008. Of this total, $598 million (88%) will be incurred off mine sites and $78 million (12%) will be incurred on mine sites.

On a provincial/territorial basis, exploration-phase expenditures are once again expected to surpass deposit appraisal expenditures in every mining province/territory (**Figure 9**). In percentage terms, New Brunswick, Saskatchewan, and Alberta are expected to have all, or almost all, of their work recorded under the exploration category. The proportion of exploration work, out of total exploration and deposit appraisal spending, in other provinces/territories is also expected to be at least 80% in the Yukon, Newfoundland and Labrador, and Manitoba.

In terms of ranking by total exploration-phase expenditures, Ontario ($521 million) is expected to take the lead over Québec ($442 million), Saskatchewan ($392 million), and British Columbia ($352 million). Nunavut ($232 million), Newfoundland and Labrador ($130 million), Manitoba ($118 million), and the Yukon ($116 million) should also be the recipients of major exploration-phase investments.

Figure 9
Exploration and Deposit Appraisal Expenditures in Canada, by Province and Territory, 2008
(Current Dollars)



Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
Notes: Exploration and deposit appraisal expenditures include off-mine-site and on-mine-site field and overhead expenditures, plus engineering, economic and feasibility studies, environment and land access costs. Data for 2008 are based on revised company intentions and are current as of December 2008.

With a $69 million increase over 2007, Ontario is expected to lead the country in terms of deposit appraisal spending with spending intentions totaling $217 million. With an expected increase of $65 million, Québec should rank second with $129 million. British Columbia should claim third place with a forecast increase of $12 million that will take its 2008 deposit appraisal spending total to $114 million. The Northwest Territories, Nova Scotia, Ontario, and Nunavut are the provinces/territories that show the most balance in their exploration/deposit appraisal portfolios.

1.3.2.3 Spending by Type of Company

Based on revised company spending intentions, a total of 131 senior project operators intended to spend $1147 million in 2008, accounting for 37% of all exploration and deposit appraisal expenditures for that year (**Figures 1** and **2**, and **Table 1**). Overall spending was expected to increase by 11%, going from $2831 million in 2007 to $3133 million in 2008. Senior spending should exceed that growth rate and rise by 24%, reflecting the producers' quest for additional resources and reserves to take advantage of what were, at the time of preparing their 2008 budgets, deemed to be favourable market conditions across a broad range of mineral commodities. Still, junior exploration spending is expected to exceed that of senior companies for the fifth year in a row, a feat that only happened once before, in 1987, when the generous Mining Exploration Depletion Allowance combined with favourable metal prices to push junior exploration spending to record highs.

About 64% of total spending by senior companies in 2008 is expected to be allocated to activities falling in the exploration work phase (**Figures 5a** and **5b**). Hence, senior companies' expenditures continue to be more balanced between exploration and deposit appraisal spending than those of junior companies. Over 80% (82%) of the expenditures intended by senior firms for 2008 were destined for Ontario ($337 million), Québec ($195 million), Saskatchewan ($149 million), Nunavut ($144 million), and British Columbia ($121 million) (**Figure 2**). The most important gains in senior spending were anticipated in Saskatchewan (+$63 million), Québec (+$51 million), Nunavut (+$44 million), and British Columbia (+$43 million).

Excluding prospectors, the number of junior project operators was expected to total 669 in 2008, compared to 708 in 2007 and 649 in 2006. Given the deteriorating economic context and the reliance of junior companies on stock markets to fund their activities, the number of junior project operators is likely to keep declining as firms are forced out of business or become dormant. Hence, the peak of 708 junior project operators recorded in 2007 will likely remain unchallenged until the outlook for minerals and metals improves radically (**Figure 1** and **Table 1**).

Back in 2000, only 387 junior companies were recorded as project operators. Therefore, this is a sector that has really benefited from the favourable conditions that prevailed in recent years. In 2008, at the tail end of this positive period, junior companies were expected to spend $1983 million ($1986 million when including prospectors). This further increase of $82 million (4%) comes on the heels of eight successive years of growth and maintains, albeit weakly, the momentum created by gains (in 2007 constant dollars and including prospectors) of 44% in 2003, 105% in 2004, 29% in 2005, 51% in 2006, and 49% in 2007 (**Figures 5a** and **5b**). Notwithstanding differences in surveying methodologies over the years, junior company spending is expected to be the highest ever recorded (in both current and constant 2007 dollars) in 2008, although *Actual* survey results (to be released in 2009) may bring the revised spending intentions total down and show that the peak in junior spending really occurred in 2007.

Contrary to previous years, this ninth consecutive increase in junior company spending will not be the result of a country-wide effort (**Figure 2**). The largest increases, in dollar terms, should occur in Ontario (+$141 million), Québec (+$42 million), and Saskatchewan (+$39 million). Significant decreases are expected in Nunavut (-$65 million), the Northwest Territories (-$62 million), and British Columbia (-$47 million). In decreasing order of expenditures, Ontario (with an outstanding total of $401 million), Québec ($376 million), British Columbia ($345 million), and Saskatchewan ($267 million) as a group are expected to account for 70% of all junior company expenditures in

Canada in 2008. Nunavut ($173 million), Newfoundland and Labrador ($113 million), and the Yukon ($106 million) should also boast strong levels of junior company expenditures while, proportionately, New Brunswick and Alberta will experience significantly higher levels of junior spending.

When not counting projects under the $50 000 level, junior company project operators typically spent $100 000 to $500 000 in the early years of the latest upward trend (2000, 2001, and 2002). Over the years, junior company project operators with higher spending ($500 000 or more) became more prevalent as this sector picked up momentum (**Table 1**). This tendency continued all the way to the revised spending intentions survey of 2008 and translated into 375 junior company project operators unveiling their intentions to spend $1 million or more. In fact, for 2008, junior company project operators were expected to number 268 in the $1 million-$5 million interval, 57 in the $5 million-$10 million interval, and 50 in the more-than-$10 million interval. Overall, the 669 junior company project operators were expected to average $3 million in spending for a total injection of almost $2 billion in the Canadian mineral exploration sector in 2008.

Hence, junior company expenditures were poised to exceed those by senior companies for the fifth year in a row in 2008. This strong performance is a testimony to these companies' ability to rapidly mobilize resources in the presence of positive market outlooks for a number of mineral commodities, favourable financing conditions, and government-provided measures to encourage grassroots-type (or off-mine-site) exploration. In this positive environment, junior companies were also able to benefit from associations with senior companies to provide funds, knowledge, and expertise in the joint exploration or outright sale of promising properties.

However, at the time of writing this report, conditions had changed dramatically for the junior mining sector. The worldwide economic slowdown that began as a credit crisis has not only affected the demand for the very products explored for by junior companies, but it has also had a direct impact on their main source of funds, the stock markets. In fact, both equity and debt financing are now much more difficult to access and this has caused the scaling down, postponement, or cancellation of a number of projects. Some of these projects were quite advanced and counted upon to become part of Canada's next wave of mining producers. Faced with such a challenging environment, junior companies, especially those with little or no cash reserves, have no choice but to try to preserve their main assets (properties) until economic conditions improve. So far, strategies employed include: project termination, renegotiaton of option agreements, negotiation of joint-venture agreements, strategic alliances with junior or senior partners, corporate cost-cutting measures (including salaries and personnel), delisting and becoming dormant, switching to less capital-intensive work while still moving projects forward, and attempting to raise equity capital despite a dilution of the shareholder base. Despite their best efforts, it is clear that a number of junior companies will not survive this downturn. Of the companies that do survive, the ones with quality projects will fare better as the providers of capital and equity become much more selective than before.

In this type of environment, government-provided incentives and assistance programs become even more important to the exploration and mining industry. In past editions of this report, the Regional Outlook section provided details on provincial/territorial incentives and programs. While no longer available in this report *per se*, the information on these tax and non-tax measures can still be found by consulting the various provincial/territorial web sites that are provided in the Regional Outlook section (Chapter 2) of this report. As for the federal Mining Exploration Tax Credit (also called the Investment Tax Credit for Exploration, or Super Flow-Through Shares), it was extended for another year in the January 27, 2009, budget. Hence, this 15% tax credit, which is linked to the use of flow-through shares, has been extended to March 31, 2010. Under existing tax rules, funds raised with this tax credit during the first three months of 2010 will be able to support eligible exploration work until the end of 2011.

1.3.2.4 Spending by Type of Commodity Sought

Because complete statistics on commodities sought are collected in the *Actual* part of the survey rather than the *Spending Intentions* component, not all data on this type of spending are available yet for 2008. Still, revised spending intentions show that the precious metals category should once again have attracted the most exploration and deposit appraisal spending in 2008 (**Figures 8a** and **8b**). However, the predicted precious metals total of $1107 million represents only an 8% increase over the $1025 million spent in 2007. Base metals were also expected to continue their progression with a forecast total of $883 million, a 24% increase over the $712 million spent in 2007. The "others" category, which includes ferrous metals, other metals and nonmetals, and coal, was also expected to experience a significant increase, going from $359 million in 2007 to $446 million in 2008, also a 24% increase. The search for uranium, which has intensified in recent years, was expected to remain strong with another $411 million in spending. Finally, diamonds, after all the developments of recent years, were expected to settle back to an expenditure total of $286 million, an 11% decrease from the $322 million spent in 2007. The effect of the economic downturn on 2008 actual spending and 2009 budgets for these commodity groups will be better understood in the next survey compilation, which will take place in the first quarter of 2009 with the 2008 Preliminary Survey and 2009 Spending Intentions Survey.

1.4 DRILLING

Drilling activities are an essential component of the mineral development cycle from the anomaly investigation stage to the deposit delineation and deposit definition stages. As such, drilling statistics constitute a valuable indicator of recent levels of Canadian mineral exploration and deposit appraisal activity.

Diamond drilling is the most widely used drilling method for determining the existence, location, extent, grade, and tonnage of a mineral deposit. This type of drilling figures in most of the following analysis although, in some cases, other types of drilling are also considered. The data are from the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures and include all metres (m) drilled and expenditures reported by companies for their "own account" (drilling they did themselves) and for contracted drilling work. Data for 2008 will only be available once the *Preliminary* survey results are released in March 2009.

1.4.1 Drilling by Work Phase

According to the federal-provincial/territorial survey, a total of 6 589 000 m of surface and underground drilling (including diamond drilling and other drilling methods) were carried out for exploration and deposit appraisal purposes in Canada in 2007, compared to 5 323 000 m in 2006 (**Tables 7** and **8**). As a result, the 6 483 000 m recorded in 1987 were surpassed for the first time in 20 years. Of the 6 589 000 m drilled in 2007, 6 351 000 m (96%) were accounted for by diamond drilling, up by 31% from the 4 849 000 m drilled in 2006.

Reflecting the continued focus on grassroots and off-mine-site types of work, some 90% (5 922 000 m) of total drilling activity in 2007 was dedicated to the exploration phase while the remaining 10% (679 000 m) was dedicated to deposit appraisal work (**Table 9**). In terms of provincial/territorial rankings, Ontario (1 625 000 m) dominated exploration-phase drilling with 29% of the total metres drilled for that year while Québec (1 276 000 m) and British Columbia (1 016 000 m) combined for another 41% (**Table 7**). On the deposit appraisal side, Ontario (345 000 m), Québec (207 000 m), and British Columbia (94 000 m) accounted for 68% of all drilling in that work phase.

TABLE 7. SURFACE AND UNDERGROUND EXPLORATION AND DEPOSIT APPRAISAL DRILLING IN CANADA, (1) BY PROVINCE AND TERRITORY, 2006 AND 2007

Province/Territory	Surface Drilling			Underground Drilling			Total Drilling		
	Exploration	Deposit Appraisal	Total	Exploration	Deposit Appraisal	Total	Exploration	Deposit Appraisal	Total
					(000 metres)				
2006									
Newfoundland and Labrador	245.5	5.6	251.1	–	27.7	27.7	245.5	33.3	278.8
Nova Scotia	33.0	1.7	34.7	–	–	–	33.0	1.7	34.7
New Brunswick	51.9	–	51.9	–	–	–	51.9	–	51.9
Québec	783.9	102.2	886.1	116.0	32.2	148.2	899.9	134.4	1 034.3
Ontario	1 014.9	139.7	1 154.6	287.0	87.6	374.6	1 302.0	227.3	1 529.2
Manitoba	142.6	–	142.6	55.6	–	55.6	198.1	–	198.2
Saskatchewan	492.3	–	492.3	12.2	–	12.2	504.5	–	504.5
Alberta	27.6	21.0	48.6	–	–	–	27.6	21.0	48.6
British Columbia	889.8	72.6	962.4	9.3	30.5	39.8	899.1	103.1	1 002.2
Yukon	222.7	8.3	231.0	–	–	–	222.7	8.3	231.0
Northwest Territories	168.1	20.1	188.2	–	–	–	168.1	20.1	188.2
Nunavut	220.8	0.3	221.1	–	–	–	220.8	0.3	221.1
Total	4 293.0	371.6	4 664.6	480.1	177.9	658.0	4 773.1	549.5	5 322.6
2007									
Newfoundland and Labrador	257.2	35.0	292.3	2.0	37.0	39.0	259.2	72.0	331.3
Nova Scotia	47.6	2.8	50.4	–	–	–	47.6	2.8	50.4
New Brunswick	137.0	1.0	137.9	–	–	–	137.0	1.0	137.9
Québec	1 170.3	115.1	1 285.4	106.1	92.0	198.1	1 276.4	207.1	1 483.5
Ontario	1 262.3	213.4	1 475.7	362.9	131.8	494.7	1 625.2	345.2	1 970.4
Manitoba	210.9	55.2	266.2	60.9	–	60.9	271.8	55.2	327.0
Saskatchewan	478.1	48.1	526.2	–	–	–	478.1	48.1	526.2
Alberta	3.5	8.3	11.8	–	–	–	3.5	8.3	11.8
British Columbia	988.5	92.8	1 081.4	27.7	1.2	28.8	1 016.2	94.0	1 110.2
Yukon	223.5	54.2	277.7	–	1.1	1.1	223.5	55.3	278.8
Northwest Territories	114.5	21.3	135.8	–	8.8	8.8	114.5	30.1	144.6
Nunavut	183.3	34.1	217.4	–	–	–	183.3	34.1	217.4
Total	5 076.7	681.4	5 758.0	559.6	271.9	831.4	5 636.2	953.2	6 589.4

Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
– Nil.
(1) Includes diamond drilling and other drilling methods such as rotary and percussion.
Note: Numbers may not add to totals due to rounding.

TABLE 8. SURFACE AND UNDERGROUND EXPLORATION AND DEPOSIT APPRAISAL DRILLING IN CANADA, 1985-2007

Year	Diamond Drilling			Other Drilling (1)		
	Metres Drilled			Metres Drilled		
	Exploration	Deposit Appraisal	Total	Exploration	Deposit Appraisal	Total
			(000 metres)			
1985	..	..	2 531	..	..	270
1986	..	..	3 616	..	..	55
1987	..	..	6 221	..	..	262
1988	..	..	6 206	..	..	211
1989	..	..	3 940	..	..	297
1990	..	..	3 702	..	..	241
1991	..	..	2 341	..	..	234
1992	..	..	1 889	..	..	139
1993	..	..	1 932	..	..	282
1994	..	..	2 626	..	..	213
1995	..	..	2 993	..	..	280
1996	..	..	3 898	..	..	169
1997 (a)	2 670	734	3 404	157	239	396
1998	2 024	433	2 458	58	82	140
1999	1 693	583	2 277	62	127	189
2000	1 490	559	2 049	22	9	31
2001	1 359	321	1 679	83	4	87
2002	1 830	476	2 306	99	13	112
2003	2 165	327	2 491	33	28	61
2004	2 977	493	3 470	49	38	87
2005	3 308	423	3 731	132	27	159
2006	4 339	510	4 849	435	39	474
2007	5 711	640	6 351	210	39	250

Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
.. Not available.
(a) The exploration and deposit appraisal phases were adopted as part of the survey redesign in 1997.
(1) Other drilling methods include reverse circulation, rotary, and percussion.

TABLE 9. SURFACE AND UNDERGROUND EXPLORATION AND DEPOSIT APPRAISAL DRILLING (1) IN CANADA, BY TYPE OF COMPANY, 2006 AND 2007

Type of Company	Exploration Drilling	Deposit Appraisal Drilling	Total by Type of Company
		(000 metres)	
2006			
Junior companies			
Surface	2 942.8	128.2	3 071.0
Underground	20.2	30.5	50.7
Subtotal	2 963.0	158.7	3 121.7
Senior companies			
Surface	1 350.2	243.4	1 593.6
Underground	459.9	147.5	607.4
Subtotal	1 810.1	390.8	2 200.9
Total	4 773.1	549.5	5 322.6
2007			
Junior companies			
Surface	3 959.7	128.6	4 088.3
Underground	46.2	33.1	79.3
Subtotal	4 005.9	161.7	4 167.7
Senior companies			
Surface	1 371.8	330.8	1 702.5
Underground	543.9	186.8	730.7
Subtotal	1 915.7	517.6	2 433.3
Total	5 921.6	679.3	6 600.9

Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
(1) Includes diamond drilling and other drilling methods such as rotary and percussion.
Note: Numbers may not add to totals due to rounding.

1.4.2 Drilling by Type of Company

After overtaking senior companies in 2005, junior companies continued to account for most of the surface and underground drilling (including diamond drilling and other drilling methods) in both 2006 and 2007. When both the exploration and deposit appraisal phases are added together, junior companies accounted for 59% (3 122 000 m) of the total 5 323 000 m drilled in 2006 and for 63% (4 168 000 m) of the 6 589 000 m drilled in 2007 (**Table 9**). In 2005, junior companies had accounted for 52% of total drilling.

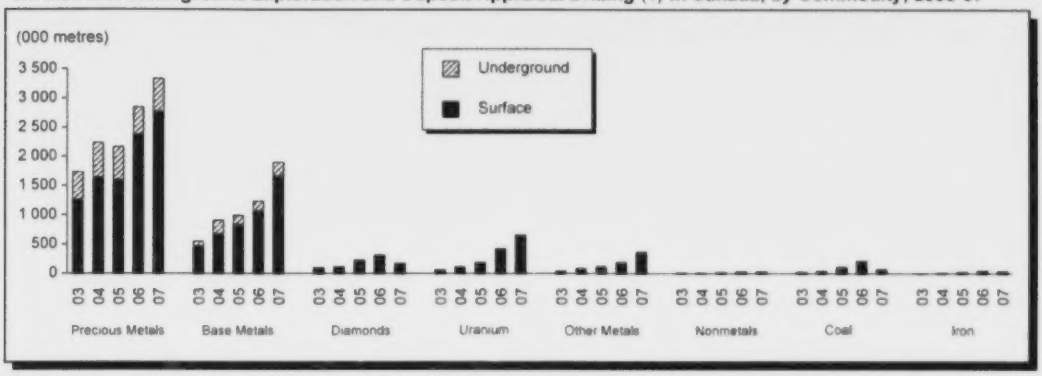
The lead that junior companies enjoy in overall drilling (surface plus underground) can be explained by their higher overall spending, which is focused on surface activities. Hence, as can be expected, junior company drilling is conducted overwhelmingly from the surface. In 2007, 98% of their drilling was classified as surface drilling and the vast majority of this was undertaken in the exploration phase.

By virtue of their ownership of underground mining operations, underground drilling continues to be associated mostly with senior companies. In 2007, senior companies accounted for 90% of the underground drilling in both work phases. In line with earlier years, surface drilling activity was more evenly distributed as junior companies accounted for 71% (4 088 000 m) of the total compared to 29% (1 703 000 m) for senior companies.

1.4.3 Drilling by Type of Commodity Sought

In terms of total surface and underground drilling (including diamond drilling and other drilling methods) by commodity group sought, **Figure 10** shows that exploration and deposit appraisal

Figure 10
Surface and Underground Exploration and Deposit Appraisal Drilling (1) in Canada, by Commodity, 2003-07



Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
(1) Includes diamond drilling and other drilling methods such as rotary and percussion.

drilling activities in Canada in the period 2003-07 were primarily aimed at the discovery of precious metals and base metals. In 2007, a total of 3 339 000 m were drilled in the search for precious metals, representing 51% of total exploration and deposit appraisal drilling. Of this total, 2 773 000 m (83%) were drilled from the surface. Drilling for base metals accounted for 29% (1 908 000 m) of total exploration and deposit appraisal drilling and, once again, surface drilling was more prevalent with 88% (1 680 000 m) of the drilling aimed at this commodity group. Among the other commodity groups, uranium and "other metals" stood out in 2007 with drilling totals of 655 000 m and 368 000 m, respectively.

As can be expected, surface drilling also accounted for most of the exploration and deposit appraisal drilling activity targeting commodities other than precious metals and base metals in 2007. In fact, it represented virtually all of the drilling conducted within these two phases of activity for the discovery of diamonds, uranium, nonmetals, coal, and iron.

1.5 CLAIM STAKING

Claim staking is another useful indicator of exploration activity. It is particularly efficient at rapidly highlighting emerging trends, such as the mid- and late-1990s exploration rush for diamonds and the uranium plays that have recently emerged in various regions of the country. Because claim staking usually happens at a relatively early stage of the exploration and deposit appraisal process, it also provides a good indication of current grassroots-type activities and a good insight into where future advanced (deposit appraisal) work could be focused.

Claim-staking rules and guidelines differ across Canada. In recent years, mineral tenure has evolved with the advent of Internet-based map staking and the granting of mineral rights to some Aboriginal groups who now administer their own regimes. Therefore, in order to ensure timeliness and accuracy of information on mineral tenure regulations in a particular Canadian jurisdiction, the reader is invited to contact the respective provincial/territorial mining recorder's office. Another useful source of information that summarizes the different mineral rights regimes found across Canada (i.e., ground vs. map staking; prospecting permits vs. claims; cost and size of claims, permits and leases; assessment work requirements; etc.) is the Provincial/Territorial Mining Rights Committee. This committee meets annually and maintains a number of summary tables on the administration of

mineral tenure in Canada. One portal where these tables can be viewed is the web site of the Ontario Ministry of Northern Development and Mines at www.mndm.gov.on.ca/mndm/mines/lands/provter/default_e.asp.

1.5.1 New Claims Staked

Just as for spending and drilling, which are the other two indicators of mineral exploration activity studied in this chapter, claim-staking activity also increased in 2007. The area of new mineral claims staked increased by 11% from 24.2 million hectares (Mha) to 26.9 Mha (**Table 10**). However, with the different claim-staking rules that apply across the country, it is difficult to look at claim-staking statistics in a national perpective. On a provincial/territorial basis, Nova Scotia (+114%), Québec (+112%), and Ontario (+70%) recorded the strongest proportional increases. In terms of actual hectares staked, 2007 data show that Québec (+2.56 Mha) recorded the largest increase, followed by Ontario (+0.75 Mha), Newfoundland and Labrador (+0.54 Mha), and British Columbia (+0.54 Mha).

1.5.2 Claims in Good Standing

In terms of area occupied by claims in good standing at the end of 2007, British Columbia (14.1 Mha), Saskatchewan (13.3 Mha), Alberta (11.4 Mha), and Québec (11.3 Mha) were the national leaders in a year that saw a 17% rise in the Canadian total (**Table 11**). This 17% increase was preceded by gains of 18% in 2006 and 38% in 2005, and by three years of stability before that when approximately 4.1% of Canada's total landmass was occupied by such claims, compared to 7.9% in 2007. The increasing area of claims in good standing in Canada indicates that some of the increased spending recorded in 2005, 2006, and 2007 has been incurred on new ground and that exploration and mining companies have decided that their new properties warrant further investigation. At the start of 2008, it would have been difficult to assert that a consolidation of claims in good standing was in the offing, but this is now a real possibility given the impact of the negative economic outlook on the mineral exploration sector.

TABLE 10. AREA OF NEW MINERAL CLAIMS (1) STAKED IN CANADA, BY PROVINCE AND TERRITORY, 2006 AND 2007

Province/Territory	2006		2007	
	(hectares)	(%)	(hectares)	(%)
Newfoundland and Labrador	1 437 800	5.9	1 980 150	7.4
Nova Scotia	313 590	1.3	671 987	2.5
New Brunswick	65 872	0.3	12 691	0.5
Québec	2 294 635	9.5	4 853 966	18.0
Ontario	1 070 816	4.4	1 817 264	6.8
Manitoba	822 074	3.4	925 576	3.4
Saskatchewan	4 579 521	18.9	3 679 961	13.7
Alberta	3 789 296	15.6	3 888 239	14.5
British Columbia	5 976 649	24.7	6 518 126	24.2
Yukon	259 056	1.1	258 124	1.0
Northwest Territories	1 861 163	7.7	1 160 821	4.3
Nunavut	1 757 506	7.3	1 134 438	4.2
Total	24 227 978	100.0	26 901 303	100.0

Source: Provincial and territorial mining recorders.
(1) Excludes coal, potash, salt, and industrial minerals, except for Alberta where industrial minerals are included. Also excludes prospecting permits for the Northwest Territories and Nunavut.
Note: Numbers may not add to totals due to rounding.

TABLE 11. AREA OCCUPIED BY CLAIMS IN GOOD STANDING IN CANADA, BY PROVINCE AND TERRITORY, 2006 AND 2007

Province/Territory	Total Area	Area of Claims in Good Standing	Area of Claims/ Total Area
	(hectares)		(%)
2006			
Newfoundland and Labrador	40 572 000	3 317 650	8.2
Nova Scotia	5 549 000	408 240	7.4
New Brunswick	7 344 000	340 400	4.6
Québec	154 068 000	8 423 423	5.5
Ontario	106 858 000	3 662 304	3.4
Manitoba	64 995 000	4 726 543	7.3
Saskatchewan	65 233 000	12 020 675	18.4
Alberta	66 119 000	9 599 084	14.5
British Columbia	94 931 000	12 246 353	12.9
Yukon	48 345 000	1 366 428	2.8
Northwest Territories	143 232 000	4 899 539	3.4
Nunavut	199 400 000	6 322 273	3.2
Total Canada	996 646 000	67 332 912	6.8
2007			
Newfoundland and Labrador	40 572 000	4 732 075	11.7
Nova Scotia	5 549 000	749 931	13.5
New Brunswick	7 344 000	597 664	8.1
Québec	154 068 000	11 348 539	7.4
Ontario	106 858 000	4 925 264	4.6
Manitoba	64 995 000	3 741 070	5.8
Saskatchewan	65 233 000	13 266 341	20.3
Alberta	66 119 000	11 437 358	17.3
British Columbia	94 931 000	14 135 800	14.9
Yukon	48 345 000	1 892 994	3.9
Northwest Territories	143 232 000	5 472 144	3.8
Nunavut	199 400 000	6 746 774	3.4
Total Canada	996 646 000	79 045 954	7.9

Sources: Natural Resources Canada; provincial/territorial mining recorders.
Note: Data for Prince Edward Island are excluded.

1.6 SHORT-TERM OUTLOOK FOR EXPLORATION AND DEPOSIT APPRAISAL SPENDING IN CANADA

The analysis of three key indicators (drilling, claim staking, and particularly spending) leads to the conclusion that Canada was in the midst of a record-setting period in its mineral exploration history before worldwide economic conditions took a turn for the worse. While the data still point to strong performances in terms of exploration and deposit appraisal spending in 2007 ($2.8 billion) and 2008 ($3.1 billion), the downturn happened so fast that companies, and by extension the survey itself, did not fully grasp its impact on their plans and projects. As a result, the 2008 totals are probably overestimated and the upcoming 2009 survey results will likely show a clear break from the upward trend that has prevailed over the last eight years.

During that period of growth, the focus was placed on off-mine-site and exploration-phase spending, both inside and outside traditional mining camps. Exploration and deposit appraisal activities were also widely distributed among various regions and mineral commodity targets, especially in the latter

years when prices rose across a broad range of products. Throughout this period, junior mining companies played a leading role, reaching record levels of activity, and took on a lot of the risk and responsibility for shaping the future of Canada's mining industry.

As the 2009 field season approaches, both junior and senior companies face an uncertain economic environment that may become one of their greatest challenges ever. Low demand for minerals and metals, debt-laden balance sheets, risk-averse equity markets, reduced debt availability, higher credit costs, and overall economic insecurity are some of the issues that these companies will have to contend with. For Canada not to suffer a lag in its mining projects pipeline, it is important that the owners of the most promising projects survive and forge ahead in anticipation of an eventual economic recovery.

2. Regional Outlook

2.1 INTRODUCTION

In past editions of this report, the Regional Outlook section presented comments from provincial and territorial officials on recent exploration and deposit appraisal activities in their respective jurisdictions and highlighted important fiscal, regulatory, and geoscientific initiatives. With this publication moving to an electronic-only delivery format and with the high quality of information, resources, and tools provided on regularly updated provincial/territorial web sites, this section now consists of a listing of useful web sites where the reader will have access to a broad range of information, data, and analyses directly from the source (please note that some links may be available in only one language).

2.2 PROVINCIAL/TERRITORIAL INFORMATION ON THE INTERNET

2.2.1 Newfoundland and Labrador

Mineral Exploration:
www.nr.gov.nl.ca/mines&en/exploration/mineral.stm

Exploration Highlights:
www.nr.gov.nl.ca/mines&en/statistics/ExpOv/ExplnReview2008.pdf

Overview:
www.nr.gov.nl.ca/mines&en/statistics/exp_overview.stm

Geoscience Online:
http://gis.geosurv.gov.nl.ca/

2.2.2 Nova Scotia

Mineral Resources Branch:
www.gov.ns.ca/natr/meb/default.asp

Mineral Exploration Activities:
www.gov.ns.ca/natr/meb/one/mea-home.htm

2.2.3 New Brunswick

Exploration Highlights:
www.gnb.ca/0078/minerals/Exploration_Highlights-e.aspx

2.2.4 Québec

Ministère des Ressources naturelles et Faune:
www.mrnf.gouv.qc.ca/mines/index.jsp

Report on Mineral Exploration Activity:
www.mrnf.gouv.qc.ca/mines/publications/publications-rapports.jsp

Investment and Fiscal Support:
www.mrnf.gouv.qc.ca/mines/fiscalite/index.jsp

Mining Title Management:
https://gestim.mines.gouv.qc.ca

2.2.5 Ontario

Mines and Minerals:
www.mndm.gov.on.ca/mines/default_e.asp

2.2.6 Manitoba

Mineral Resources:
www.gov.mb.ca/stem/mrd/index.html?

Exploration Activity Tracker:
www.gov.mb.ca/stem/mrd/geo/gis/activity/index.html

2.2.7 Saskatchewan

Mineral Resources:
www.ir.gov.sk.ca/mining

2.2.8 Alberta

Minerals:
www.energy.gov.ab.ca/News/minerals.asp

Alberta Geological Survey:
www.ags.gov.ab.ca/

2.2.9 British Columbia

Ministry of Energy, Mines and Petroleum Resources:
www.gov.bc.ca/empr/

Overview of Trends:
www.empr.gov.bc.ca/Mining/MineralStatistics/IndustryOverviews/Pages/BCProvTrends.aspx

2.2.10 Yukon

Minerals:
www.emr.gov.yk.ca/mining/

Yukon Geological Survey:
www.geology.gov.yk.ca/

Yukon Mining Recorder:
www.yukonminingrecorder.ca/

2.2.11 Northwest Territories

Mining, Oil and Gas:
www.iti.gov.nt.ca/miningoilgas/

Diamonds:
www.iti.gov.nt.ca/diamonds/

2.2.12 Nunavut

Exploration Overview:
www.nunavutgeoscience.ca/eo/index_e.html

Department of Economic Development and Transportation:
www.edt.gov.nu.ca/apps/authoring/dspPage.aspx?page=home

3. Canadian Global Exploration Activity

3.1 INTRODUCTION

This section provides an overview of Canadian mineral exploration activity[8] abroad. It also highlights the domestic and foreign components of the larger-company exploration market in Canada. The information in this review was current as at January 2009.

3.2 GLOBAL MARKET FOR MINERAL EXPLORATION

The value of exploration programs expected to be undertaken worldwide in 2008 for precious metals, base metals, and diamonds (**Table 12**) reached US$12.6 billion, up by US$2.7 billion, or 27%, from the US$9.9 billion that companies had planned to spend in 2007.[9] The value of these programs includes the budgets of the larger companies and those of the smaller companies. It also includes estimates for firms that do not disclose their exploration plans and for firms that were likely to spend less than US$100 000 in 2008. For the second year, the Metals Economics Group (MEG) has included uranium in its survey of company planned exploration budgets. However, uranium will not be included in this analysis in order to keep the numbers comparable to previous years.

The world's larger companies are defined here as those companies that planned to spend at least US$3 million annually on mineral exploration in 2008; the world's smaller companies are defined as those companies that planned to spend at least US$100 000, but less than US$3 million, on mineral exploration in 2008. This definition of larger and smaller companies should not be confused with the MEG definition of a junior and senior company where the division is based on revenue for the seniors and equity financing for juniors. In fact, the larger-company category has included increasing numbers of "junior" companies as the equity markets have provided significant junior equity financing in recent years.

The number of companies that reported budgets for mineral exploration of at least US$100 000 in 2008 decreased to 1908, down by 58 firms, or 3%, from 1966 the previous year. As a group these 1908 companies planned to spend US$12.601 billion in 122 countries, the same number of countries as in 2006 and 2007. A total of 1153 of these companies, or 65%, were based in Canada.

Compared with the previous year, the budgets of companies that planned to spend at least US$100 000 on mineral exploration in 2008 increased for about 70% of the countries in which they

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[8] Most of the statistical data on the larger-company mineral exploration market are based on *Corporate Exploration Strategies: A Worldwide Analysis*, published annually by the Metals Economics Group, Halifax, Nova Scotia. MEG defines exploration as work from the earliest stage through perimeter drilling, reconnaissance, and evaluative forays, as well as work to further quantify and define an identified orebody once the target outline stage has been completed. It includes all feasibility work up to the point of a production decision.

[9] All currencies in this review are expressed in current U.S. dollars, except for the use of constant dollars in some of the figures. In previous versions of this article, constant U.S. dollars were used.

TABLE 12. WORLDWIDE EXPLORATION BUDGETS FOR PRECIOUS METALS, BASE METALS AND DIAMONDS, BY TYPE OF COMPANY AND BY DOMICILE OF COMPANY, 2008

	Canada	Australia	Africa-Middle East	Europe-FSU	United States	Latin America	Other Asia-Pacific	Total	Proportion of Subtotal
				($ millions)					(%)
Larger companies	4 724.9	1 927.7	619.6	1 962.3	832.9	919.1	305.9	11 292.4	89.61
Smaller companies	726.6	404	18.4	62.5	66.4	15.7	15.2	1 308.8	10.39
Total	5 451.5	2 331.7	638	2 024.8	899.3	934.8	321.1	12 601.2	100

Source: Natural Resources Canada, based on *Corporate Exploration Strategies: A Worldwide Analysis*, Metals Economics Group, Halifax, Nova Scotia.
Notes: "Larger companies" are defined here as those with budgets for mineral exploration in 2008 of US$3 million or more. Numbers may not add to totals due to rounding.

expected to operate. Aggregate year-over-year company budgets grew by US$527 million for Australia, by US$503 million for Canada, by US$200 million for Peru, by US$191 million for Mexico, by US$167 million for Chile, by US$145 million for the United States, by US$103 million for Indonesia, and by US$98 million for Brazil. As for the 36 countries where exploration budgets were expected to decrease from 2007 to 2008, the largest decrease was by US$26 million for Russia and the second largest decrease was by US$21 million for Guinea. Total lost budgets were a relatively small US$192 million.

3.3 WORLD'S LARGER COMPANIES

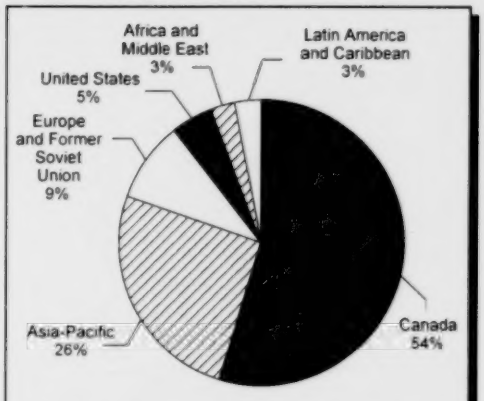
Global trends in mineral exploration are generally based on data for the world's larger companies. The focus of this chapter is on this group of companies.

During 2008, the world's larger companies were expected to undertake exploration programs with a combined value of US$11.292 billion in 108 countries, 31 more countries than in 2007. The aggregate budgets of the world's larger companies increased by 42%, up from US$7.945 billion the previous year.

In 2008, the number of companies based around the world that intended to spend at least US$3 million on mineral exploration leaped to 788 (**Figure 11**), a record high for the fourth year in a row. In 2007, 579 companies had planned to spend an equivalent amount.

Although, in 2008, the world's 788 larger companies represented 41% of the 1908 companies that reported exploration budgets of at least US$100 000, they accounted for 90% of the value of their programs (**Table 12**). On a commodity basis, the larger companies accounted for 93% of the value of worldwide programs aimed at diamonds, for 92% of those aimed at base metals, for 92% of those aimed at platinum group metals (PGM), and for 87% of those aimed at gold.

Figure 11
Distribution of the World's Larger Exploration Companies, by Domicile, 2008



Based on 788 companies with budgets of at least US$3 million for precious-metal, base-metal or diamond exploration.

Source: Natural Resources Canada, based on *Corporate Exploration Strategies: A Worldwide Analysis*, Metals Economics Group, Halifax, Nova Scotia.

On a regional basis, the world's larger companies accounted for 95% of the value of the exploration programs planned for Europe and the former Soviet Union (FSU), for 93% of those planned for Africa and the Middle East, for 93% of those planned for Latin America and the Caribbean, for 87% of those planned for the United States, for 93% of those planned for other Asia-Pacific countries, for 83% of those planned for Australia, and for 84% of those planned for Canada.

3.4 WORLD'S SMALLER COMPANIES

During 2008, the world's smaller companies were expected to undertake exploration programs around the world with a combined value of US$1.309 billion. About 30% of the budgets of these companies were expected to be spent in Canada. In 2008, 1120 companies were classified as smaller companies, down from 1387 in 2007. Almost 56% of these companies were based in Canada.

The smaller companies are significant contributors to mineral exploration and development in many regions of the world. In many countries, the smaller companies are the only ones that undertake commercial mineral exploration. In 2008, there were eight countries where the only firms planning to be active in mineral exploration were smaller companies. This is a significant difference from previous years when up to 45 countries were visited by only small companies. Senior companies are expanding their interests in more remote/underexplored areas of the world.

The smaller companies are a significant component of the exploration activity occurring in Australia and Canada. In 2008, the smaller Canadian-based companies (companies planning to spend between US$100 000 and US$3 million) accounted for 13% of the budgets of the smaller and larger Canadian-based companies combined; in Australia, the comparable figure was 17%.

The smaller Canadian companies planned to spend US$386 million in Canada, or 53% of their worldwide budgets of US$727 million; in Australia, the comparable figures were US$288 million, or 71% of worldwide budgets of US$404 million.

Although the world's smaller companies accounted for 10% (**Table 12**) of the value of all exploration programs expected to be undertaken worldwide during 2008, their activities will not be analyzed further in this chapter.

3.5 LARGER CANADIAN-BASED COMPANIES

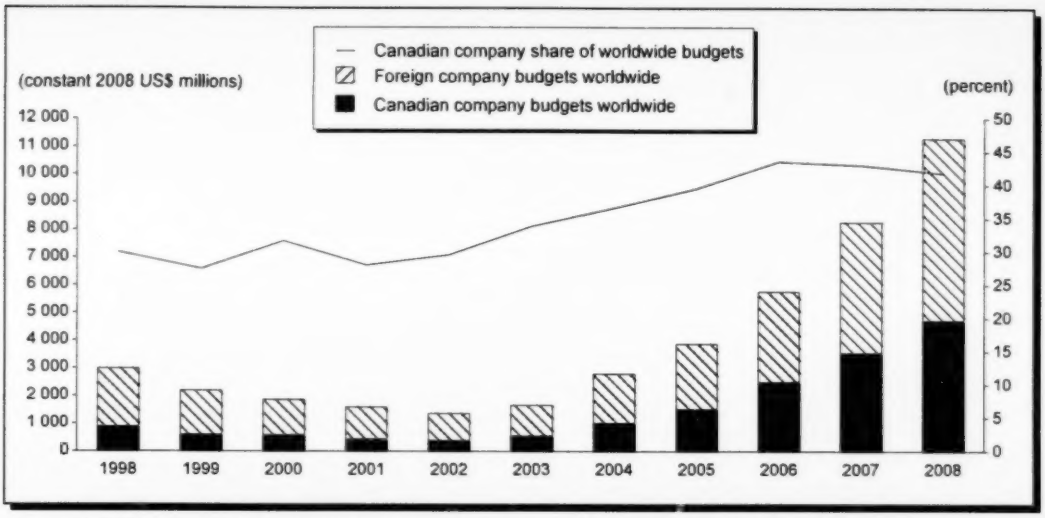
There are more mining companies based in Canada than anywhere else. In 2008, 431 of the world's 788 larger companies (companies planning to spend more than US$3 million) were based in this country (**Figure 11**). In the previous year, 327 of the 579 larger companies were based in Canada.

In 2008, the value of the exploration programs that the larger Canadian-based companies planned to undertake in Canada and elsewhere around the world increased to more than US$4.7 billion (**Figure 12**), up by US$1306 million, or 38%, from the US$3.4 billion they budgeted in 2007.

The larger Canadian-based companies allocated 47% of their budgets to explore for gold, 34% to explore for base metals, 5% to explore for diamonds, and 1% to explore for PGM. The proportion of their budgets allocated to gold was essentially unchanged from 2007, while the proportion allocated to both gold and PGM remained the same, base metals decreased slightly, and diamonds increased marginally. In comparison, the average world proportions allocated to gold, base metals, diamonds, and PGM in 2008 stood at 39%, 41%, 8%, and 3%, respectively.

The value of the programs that the larger Canadian-based companies planned to undertake during 2008 was 42% of the value of all larger-company exploration programs for the entire world, a slight decrease from 2007. However, adding the value of the programs of the smaller Canadian-based

Figure 12
Exploration Budgets of the World's Larger Companies, by Domicile, 1998-2008
Companies With Worldwide Budgets of at Least US$3 Million in 2008 for Precious-Metal, Base-Metal or Diamond Exploration



Source: Natural Resources Canada, based on *Corporate Exploration Strategies: A Worldwide Analysis*, Metals Economics Group, Halifax, Nova Scotia.
Notes: The worldwide exploration budgets of companies that intended to spend less than US$3 million in 2008 and an equivalent amount in previous years are excluded. The worldwide exploration budgets for other commodities such as uranium or industrial minerals are also excluded.

companies to those of the larger ones raises the proportion of the value of exploration programs planned by Canadian-based companies here and abroad to 43% of all the activity expected worldwide.

Canadian companies account for the dominant share, by far, of the value of all mineral exploration programs planned worldwide by the larger companies. In contrast, in 2008, the larger companies based in Africa accounted for 5%, those based in Europe accounted for 13%, those based in Australia accounted for 17%, those based in the United States accounted for 57%, and South America-based companies accounted for 7%.

The larger Canadian-based companies typically budget less individually for exploration programs than the industry average worldwide. In 2008, the aggregate exploration budgets of the larger Canadian-based companies had a mean of US$6.8 million and a median of US$4.0 million. This compared with global averages of US$7.5 million and US$4.0 million, respectively. The largest Canadian mineral exploration budget in 2008 was, for the second year in a row, budgeted by Ivanhoe Mines Ltd. and was also the world's largest at US$215 million targeted for Mongolia. The second largest mineral exploration budget by a Canadian-based company in 2008 was US$101 million by Goldcorp Inc. destined for Canada, while the largest budget of a non-Canadian company was US$119.3 million by BHP Billiton destined for Australia.

Recognizing that companies of different sizes and based in different regions of the world can have significant variations between exploration budgets and exploration expenditures, the use of aggregate budgets will generally provide a more reliable estimate of the total amount that is likely to be spent in the field.

For 2007, 1853 companies based around the world provided data for both their exploration expenditures and for their exploration budgets. Of these 1853 companies, 687 were classified as larger companies and 1166 as smaller companies. In total, these 1853 companies had planned to spend US$10.350 billion on exploration during 2007. However, by the end of the year, they had actually spent US$10.381 billion, an increase of $31 million, or less than 1%. These 687 larger companies spent US$294 million less than they had initially planned, or a decrease of about 3%. The 1166 smaller companies spent US$325 million more than they had initially planned, an increase of almost 24%. In comparison, 393 larger Canadian-based companies underspent their aggregate budgets of US$3.917 billion by US$151 million, or roughly 4%, while 665 smaller Canadian-based companies exceeded their aggregate budgets of US$803 million by US$158 million, or by more than 20%. In 2007, the departure of expenditures from the budgets of individual companies ranged between US$25 million under budget and US$63 million over budget for the larger companies and between US$2.6 million under budget and more than US$22.5 million over budget for the smaller ones. In comparison, in 2006, the larger Canadian-based companies exceeded their exploration budgets by less than 1%.[10]

In early 2009, companies of all sizes listed on Canadian stock exchanges held interests in a portfolio of more than 8347 mineral properties located in Canada or in more than 100 other countries around the world.[11] Most of this portfolio consists of properties at the early stages of exploration. The number of properties in which these companies held interests worldwide early in 2009 decreased by more than 400, or by about 5%, compared with the number that they held at the end of the previous year. The portfolio of mineral property interests decreased by 1% for properties abroad and by over 8% for domestic properties.

3.6 LARGER-COMPANY EXPLORATION MARKET IN CANADA

In 2008, the larger-company mineral exploration market in Canada was valued at US$2008 million (**Figure 13**), up by over US$539 million, or 37%, from roughly US$1469 million in 2007. For the seventh year in a row, Canada remained the country where the global mineral exploration industry expected to be the most active in 2008. Australia held that position from 1992 through 2001.

In 2008, 249 of the world's larger domestic-based or foreign-based companies planned to explore for minerals in Canada, up from 164 such companies in 2007. During 2008, more than 18% of the exploration efforts of the world's larger companies were expected to take place in Canada, compared with 18.5% in 2007 (**Figure 14**). However, when the exploration programs of the smaller companies are included with those of the larger ones, the proportion of the world's total exploration activity planned for Canada in 2008 is 19%, essentially the same as in 2006 and 2007 (if spending on uranium is included, the Canadian share would increase to just over 20%).

3.6.1 Larger Canadian-Based Companies in Canada

In 2008, 219 of the larger Canadian-based companies allocated, in total, almost US$1.6 billion for mineral exploration in Canada (**Figure 13**). Their budgets were up by about US$351 million, or 28%, from the US$1.2 billion that they allocated in 2007. For the ninth year in a row, Canadian companies planned to spend more on mineral exploration in Canada than they planned to spend in all of

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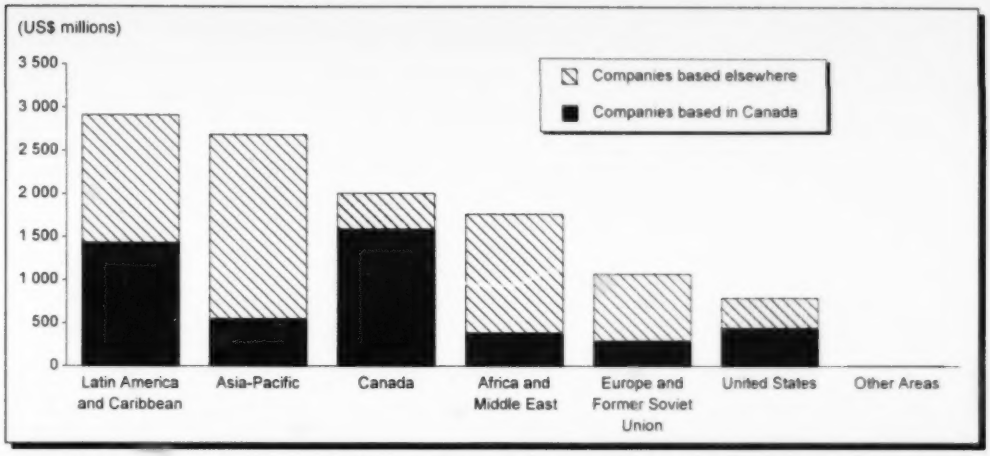
[10] See "Canada's Global Mining Presence," in the 2005 edition of the *Canadian Minerals Yearbook*, Natural Resources Canada, Ottawa (www.nrcan-rncan.gc.ca/mms-smm/busi-indu/cmy-amc/content/2005/08.pdf).

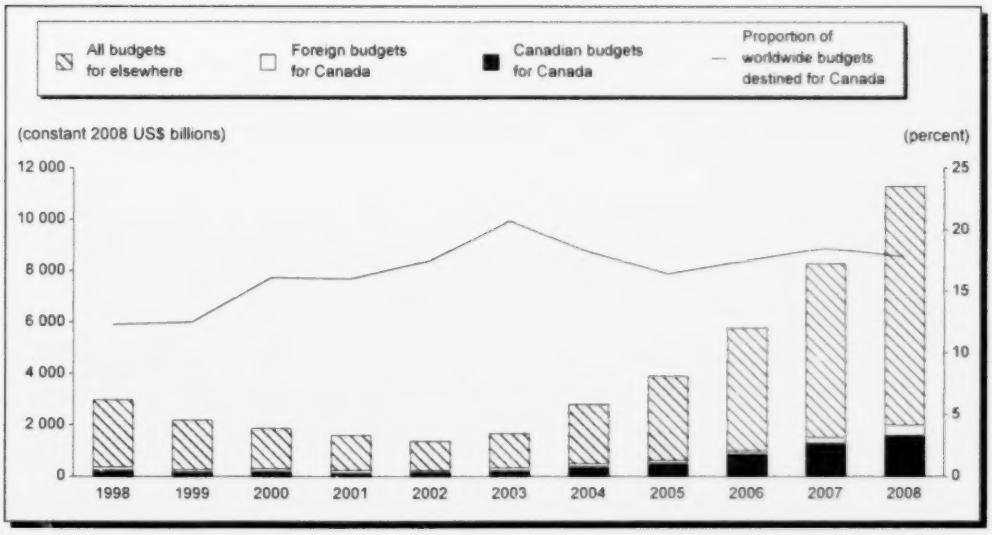
[11] For 1998 through 2008, the data are derived from InfoMine db. These databases are products of Robertson Info-Data Inc. of Vancouver, British Columbia.

Figure 13
Exploration Budgets of the World's Larger Companies for Selected Regions of the World, 2008
Companies With Worldwide Budgets of at Least US$3 Million for Precious-Metal, Base-Metal or Diamond Exploration



Source: Natural Resources Canada, based on *Corporate Exploration Strategies: A Worldwide Analysis*, Metals Economics Group, Halifax, Nova Scotia.
Notes: The worldwide exploration budgets of companies that intended to spend less than US$3 million in 2008 are excluded. The worldwide exploration budgets for other commodities such as uranium or industrial minerals are also excluded.

Figure 14
Exploration Budgets of the World's Larger Companies for Canada and Elsewhere, 1998-2008
Companies With Worldwide Budgets of at Least US$3 Million in 2008 for Precious-Metal, Base-Metal or Diamond Exploration



Source: Natural Resources Canada, based on *Corporate Exploration Strategies: A Worldwide Analysis*, Metals Economics Group, Halifax, Nova Scotia.
Notes: The worldwide exploration budgets of companies that intended to spend less than US$3 million in 2008 and an equivalent amount in previous years are excluded. The worldwide exploration budgets for other commodities such as uranium or industrial minerals are also excluded.

the Latin American countries combined. In 2008, the share of the larger-company mineral exploration market in Canada controlled by large Canadian-based companies reached 79.5%, a decrease from the high of 87% in 2006 and 85% in 2007.

In 2008, the larger Canadian-based companies allocated 34% of their global exploration budgets to programs in Canada, about 2% less than the previous year. In comparison, in 2008, the larger Australian-based companies allocated 53% of their global budgets to domestic exploration while U.S. companies allocated 35%.

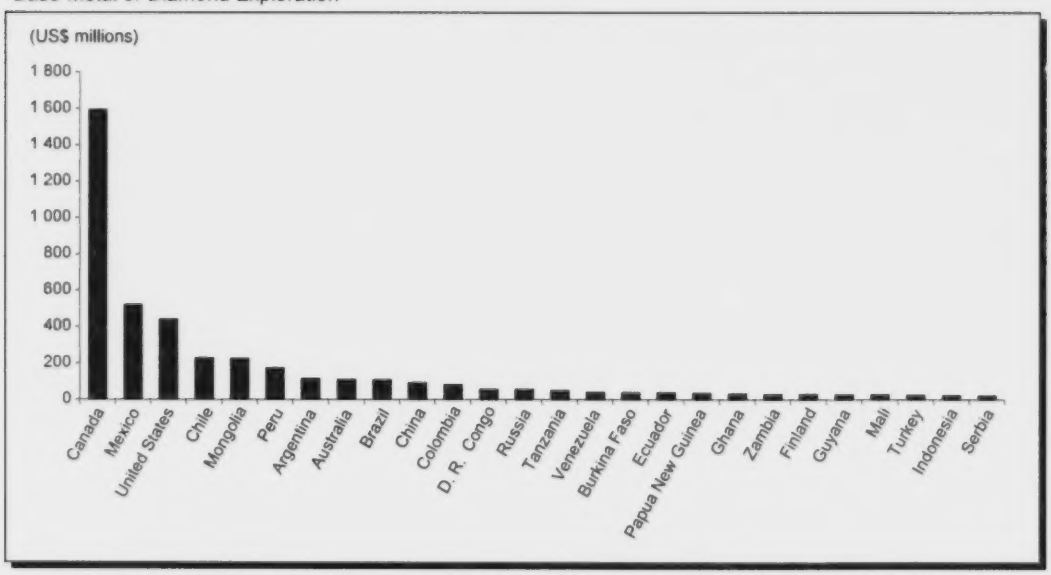
Although Canadian companies operate all over the world, Canada remains the country where they conduct the largest proportion, by far, of their global mineral exploration programs (**Figure 15**).

3.6.2 Foreign-Based Companies in Canada

During 2008, 30 of the larger foreign-based companies planned to spend, in total, almost US$411 million on mineral exploration in Canada (**Figure 13**), compared with US$224 million in 2007. In 2008, foreign-based companies were expected to undertake 21% of all larger-company exploration programs planned for this country. Almost 49% of foreign exploration budgets for Canada were aimed at base metals, and diamonds accounted for 27%.

The larger foreign-based companies active in mineral exploration in Canada in 2008 included Newmont Mining Corp. based in the United States; Xstrata plc based in Switzerland; Vale based in

Figure 15
Exploration Budgets of the Larger Canadian-Based Companies, 2008 – Countries Accounting for 90% of Canadian Budgets
Companies With Worldwide Budgets of at Least US$3 Million for Precious-Metal, Base-Metal or Diamond Exploration



Source: Natural Resources Canada, based on *Corporate Exploration Strategies: A Worldwide Analysis*, Metals Economics Group, Halifax, Nova Scotia.
Notes: The worldwide exploration budgets of companies that intended to spend less than US$3 million in 2008 are excluded. The worldwide exploration budgets for other commodities such as uranium or industrial minerals are also excluded.

Brazil; the De Beers Group based in Luxembourg; Zinifex Limited based in Australia; and Lonmin Plc, the Rio Tinto group, and Anglo American plc., all based in the United Kingdom.

In 2008, Newmont planned to spend roughly US$82 million on mineral exploration in Canada. Newmont's budget was the largest reported for this country for that year. Almost 52% of that budget was directed at diamond exploration and 48% was directed at gold exploration.

3.7 LARGER CANADIAN-BASED COMPANIES ABROAD

In 2008, the larger Canadian-based companies planned to spend almost US$3.1 billion on mineral exploration outside of Canada (**Figure 13**). Their foreign budgets were up by more than US$950 million, or 44%, from the US$2.2 billion that they planned to spend in 2007.

Roughly two thirds of the worldwide budgets of the larger Canadian-based companies were allocated to programs abroad in 2008, about the same proportion as in each of the previous six years.

Almost 67% of the 431 larger Canadian-based companies planned to work abroad during 2008. Of these 431 companies, 212 (49%) planned to work only abroad while 72 (17%) planned to work in both Canada and abroad. Only 147 (34%) of the 431 larger Canadian-based companies planned to work only in this country.

Although mining is a global enterprise, undertaking exploration programs in several countries simultaneously is relatively uncommon. In 2008, only 13 (3%) of the 431 larger Canadian-based companies budgeted for programs in five or more countries, 129 (30%) budgeted for programs in two or more countries but in less than five, and 289 (67%) budgeted for programs in only one country.

At the beginning of 2009, companies of all sizes listed on Canadian stock exchanges held interests in a portfolio of 4115 mineral properties located abroad, down by 60 properties when compared to the number held at the end of the previous year.

3.7.1 United States

In 2008, the larger-company mineral exploration market in the United States was valued at US$793 million (**Figure 13**), or roughly 7% of the US$11.3 billion larger-company market worldwide. Larger-company budgets for the United States were up by US$204 million, or 35%, compared with those of the previous year. Seventy-three of the larger Canadian-based companies planned to spend, in total, almost US$443 million in the United States, up from US$341 million in 2007.

The share of the larger-company mineral exploration market held by Canadian-based companies in the United States in 2008 stood at almost 56%, down slightly from 58% the previous year. The United States moved to third place after Canada and Mexico in terms of countries where Canadian companies are the most active in mineral exploration, after being in second place in 2007 (**Figure 15**).

During 2008, Canadian companies planned to spend almost two thirds more than U.S. firms on mineral exploration in the United States. U.S. companies accounted for almost 37% of the value of exploration programs in their country in 2008.

The United States is likely to remain, for the foreseeable future, one of the top foreign countries where the larger Canadian-based companies hold their largest portfolio of mineral properties.

3.7.2 Latin America and the Caribbean

In 2008, the larger-company mineral exploration market in Latin America and the Caribbean was valued at US$2.9 billion (**Figure 13**), or 26% of the US$11.3 billion larger-company market world-

wide. The larger-company mineral exploration market in the region grew by US$1012 million, or 53%. Latin America and the Caribbean experienced the largest year-over-year percentage growth in larger-company exploration budgets of any region. The larger Canadian-based companies planned to spend US$1437 million there, up by more than US$540 million, or by over 60%, from US$897 million in 2007.

After Canada, Latin America and the Caribbean is the region of the world where Canadian companies are currently the most active in mineral exploration (**Figure 13**).

In 2008, Canadian companies held 49% of the larger-company mineral exploration market in Latin America and the Caribbean, up slightly from 47% the previous year. The Canadian share is the largest, by far, of all international competitors in the region and amounts to roughly US$871 million more than the amount domestic companies planned to spend there. The share of the exploration market held by local companies in the region stood at 19% in 2008.

3.7.2.1 Mexico

In 2008, the larger-company mineral exploration market in Mexico was valued at US$717 million, or roughly 6% of the US$11.2 billion larger-company market worldwide. Larger-company budgets for Mexico increased by almost US$256 million, or by 55%, compared with those of the previous year.

In 2008, Mexico ranked first in Latin America, and second in the world, in terms of countries where Canadian companies are the most active in mineral exploration (**Figure 15**). Seventy-one of the larger Canadian-based companies planned exploration programs for Mexico during 2008. These companies planned to spend, in total, US$523 million, which represents 73% of the larger-company market in that country.

3.7.2.2 South America

In 2008, the larger-company mineral exploration market in South America was valued at US$2.1 billion, or almost 19% of the US$11.3 billion larger-company market worldwide. From 2007 to 2008, the larger-company mineral exploration market in the region grew by US$751 million, or by more than 56%.

One hundred and twenty-one of the larger Canadian-based companies planned to spend, in total, US$867 million in South America, almost US$349 million more than during the previous year. Their programs accounted for 41% of all larger-company mineral exploration activity planned there, whereas South America-based companies exploring in that region accounted for 26%.

Countries where Canadian companies are the most active in mineral exploration include Chile, Peru, Argentina, Brazil, and Colombia, which ranked fourth, sixth, seventh, ninth, and eleventh, respectively (**Figure 15**).

3.7.2.3 Central America

In 2008, the larger-company mineral exploration market in Central America was valued at US$42 million, or less than 1% of the $11.3 billion larger-company market worldwide. From 2007 to 2008, the larger-company mineral exploration market decreased by US$9 million, or by 17%. The larger Canadian-based companies planned to spend US$22 million in the region.

Central America is one of the regions of the world where the smaller companies, and those based in Canada in particular, account for a substantial proportion of the mineral exploration activity that usually takes place there. In 2008, the smaller Canadian-based companies were expected to account for 97% of the $8.7 million smaller-company exploration market in that region.

3.7.3 Europe and the Former Soviet Union

In 2008, the larger-company mineral exploration market in Europe and the FSU was valued at US$1074 million (**Figure 13**), or 10% of the $11.3 billion larger-company market worldwide. From 2007 to 2008, the market in the region grew by more than US$166 million, or by almost 18%. The larger Canadian-based companies planned to spend US$299 million in the region, about US$91 million more than they had planned to spend there in 2007.

3.7.3.1 Western Europe

In 2008, the larger-company mineral exploration market in western Europe was valued at US$217 million, or roughly 2% of the $11.3 billion larger-company market worldwide. From 2007 to 2008, the larger-company mineral exploration market in the region grew by US$98 million, or almost 83%. The larger Canadian-based companies planned to spend about US$117 million in the region, almost double the amount that they had planned to spend during the previous year.

3.7.3.2 Eastern Europe

In 2008, the larger-company mineral exploration market in eastern Europe was valued at US$128 million, or roughly 1% of the $11.3 billion larger-company market worldwide. From 2007 to 2008, the market in the region grew by US$36 million. The larger Canadian-based companies planned to spend about US$84 million there, about twice the amount that they had planned to spend the previous year.

3.7.3.3 Former Soviet Union

In 2008, the larger-company mineral exploration market in the FSU was valued at US$729 million,[12] or roughly 6.5% of the $11.3 billion larger-company market worldwide. The market in the FSU grew by US$32 million. The larger Canadian-based companies planned to spend US$99 million in the FSU, up from US$85 million in 2007.

3.7.4 Africa and the Middle East

In 2008, the larger-company mineral exploration market in Africa and the Middle East was valued at US$1.77 billion (**Figure 13**), or more than 16% of the $11.3 billion larger-company market worldwide. From 2007 to 2008, exploration budgets for the region grew by US$440 million, or by over 33%. Africa accounts for almost all of the mineral exploration market in Africa and the Middle East.

3.7.4.1 Africa

In 2008, the larger-company mineral exploration market in Africa was valued at US$1.74 billion, or more than 15% of the US$11.3 billion larger-company market worldwide. From 2007 to 2008, the larger-company market there grew by US$421 million, or by 32%. The larger Canadian-based companies planned to spend US$390 million in Africa, equivalent to 22% of the larger company market on that continent. From 2007 to 2008, the larger Canadian-based companies almost doubled their budgets for Africa.

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[12] The size of the mineral exploration market in certain regions of the world is underestimated because there are few data available on the extent of exploration programs undertaken by some private enterprises and state agencies.

3.7.4.2 Middle East

In 2008, the larger-company mineral exploration market in the Middle East was valued at US$23 million. None of the larger Canadian-based companies planned to explore in that region of the world during 2008.

3.7.5 Asia-Pacific

In 2008, the larger-company mineral exploration market in Asia-Pacific was valued at US$2.7 billion (**Figure 13**), or more than 24% of the US$11.3 billion larger-company market worldwide. From 2007 to 2008, the larger-company market in the region grew by US$979 million. The larger Canadian-based companies planned to spend US$554 million in Asia-Pacific, equivalent to more than 20% of the market there. In 2007, the larger Canadian-based companies had planned to spend US$467 million in the region.

3.7.5.1 Southeast Asia

In 2008, the larger-company mineral exploration market in Southeast Asia was valued at almost US$350 million, or roughly 3% of the US$11.3 billion larger-company market worldwide. From 2007 to 2008, the market in the region grew by more than US$122 million.

The larger Canadian-based companies planned to spend US$73 million in the region. Their largest aggregate budgets were for Papua New Guinea, where they planned to spend US$37 million in total.

3.7.5.2 East Asia

In 2008, the larger-company mineral exploration market in East Asia, which includes China, Mongolia, and South Korea, was valued at US$570 million,[12] or 5% of the US$11.3 billion larger-company market worldwide. From 2007 to 2008, the market in East Asia grew by US$79 million. The larger Canadian-based companies planned to spend US$326 million in the region, equivalent to more than 57% of the market there. They had planned to spend similar amounts the previous year.

3.7.5.3 South Pacific

In 2008, the larger-company mineral exploration market in the South Pacific was valued at US$1.7 billion, or almost 15% of the US$11.3 billion larger-company market worldwide. From 2007 to 2008, the market in the South Pacific grew by US$722 million. The larger Canadian-based companies planned to spend US$150 million in the region, about two thirds more than in 2007. The majority of their budgets for the region were destined for Australia. Australia ranks eighth in the world in terms of countries where the larger Canadian-based companies are the most active in mineral exploration (**Figure 15**).

3.7.5.4 South Asia

In 2008, the larger-company mineral exploration market in South Asia, which includes India and Pakistan, was valued at US$107 million, or just under 1% of the US$11.3 billion larger-company market worldwide. In 2008, the size of the market in the region grew by almost US$54 million compared to the previous year. The larger Canadian-based companies planned to spend US$15 million less in the region than in 2007.

3.8 SUMMARY AND OUTLOOK

The year 2008 was a year of rationalizing and pulling back on planned exploration budgets by mining companies for international and domestic projects compared to the previous year. Total budgeted spending worldwide for base metals, precious metals, diamonds, and PGM reached US$12.6 billion.

The larger Canadian-based companies planned to spend a total of US$4.7 billion and the smaller Canadian-based companies planned to spend US$720 million for a total of US$5.5 billion (43% of the US$12.6 billion world total and more than for any other country or region surveyed).

The US$4.7 billion planned by the larger Canadian-based companies represented 42% of the total US$11.3 billion budgeted by all larger companies in the world. Thus, the larger Canadian-based companies held a dominant share of mineral exploration programs worldwide.

These Canadian-based larger companies planned to spend 34% (US$1.6 billion) of their budgets in Canada, 9% (US$443 million) in the United States, and 11% (US$523 million) in Mexico.

In total, there were 1300 large and small companies listed on Canadian stock exchanges in Canada in early 2009.[11] At the beginning of 2009, these companies held interests in more than 8300 mineral properties worldwide.

APPENDIX

Historical Exploration and Deposit Appraisal Statistics

INTRODUCTION

This Appendix contains data and analyses that are based on pre-1997 survey definitions when only field and overhead costs were considered. While more restricted by this measure of exploration and deposit appraisal activity, the data are available over a much longer time period. The resulting time series provides useful statistics for studying historical trends in Canadian mineral exploration spending.

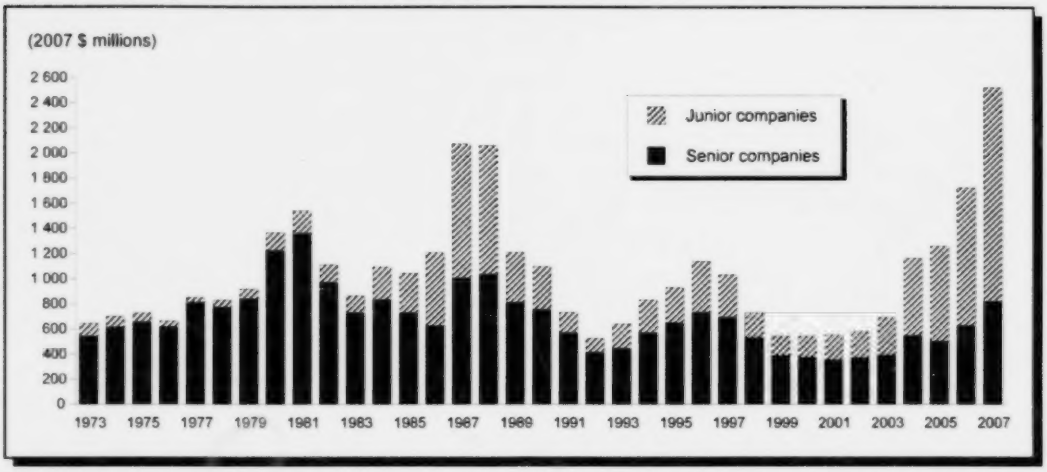
HISTORICAL SUMMARY

Figure 16 depicts Canadian exploration and deposit appraisal expenditures (field and overhead costs only) in constant 2007 dollars over the period 1973-2007. Above-normal expenditures in the 1980-82 period resulted from high prices for gold, silver, and copper over much of that period. Spending declined somewhat in 1983, but generally rose from 1984 to 1988 as a result of the introduction by the federal government, in 1983, of the Mining Exploration Depletion Allowance (MEDA). MEDA was replaced in 1989 and 1990 by the Canadian Exploration Incentive Program (CEIP). By 1987 and 1988, expenditures had reached unprecedented high levels because of MEDA and the high gold prices that had prevailed until the end of 1987. However, spending fell dramatically after 1988 and decreased until 1992 when it reached its lowest inflation-adjusted level since 1966.

Activity picked up gradually in the 1993-96 period. Expenditures increased by 118% from 1992 to 1996, and the 1996 level of $1137 million (2007 dollars) was the highest since 1989. Although exploration and deposit appraisal spending declined to $1029 million (2007 dollars) in 1997, it still remained relatively strong by historical standards. However, spending dropped significantly in 1998 to $726 million (2007 dollars), a 29% decline from 1997. After another 25% decline, the 1999 total of $543 million (2007 dollars) represented the second-lowest total in almost the past four decades. The recovery began almost imperceptibly in 2000 when field and overhead spending increased by $2 million and gathered a little momentum in 2001 when spending reached $553 million (2007 dollars). Data on field and overhead spending for the period 2002-07 show an acceleration of the upward trend as field and overhead spending, buoyed by strong metal prices, eventually reached successive record levels of $1722 million in 2006 and $2521 million in 2007.

The relatively higher expenditure levels that were recorded from 1993 to 1997 resulted, to a large extent, from important discoveries of diamonds in Canada's North and nickel-copper-cobalt in Labrador. A combination of factors took over after 1997 to bring Canadian mineral exploration and deposit appraisal activity to dangerously low levels where both the resilience of the Canadian junior mining sector and the ore reserve sustainability of a number of mineral producers were tested. Metal prices constituted the primary factor behind this slide as generally low demand for metals was exacerbated by worldwide economic events (i.e., the Asian financial crisis and the September 2001 terrorist attacks in the United States) and by corporate scandals (e.g., the Bre-X affair).

Figure 16
Exploration and Deposit Appraisal Expenditures (1) **(Field Work and Overhead) in Canada, by Junior and Senior Companies, 1973-2007** (2007 Dollars)



Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
(1) Includes on-mine-site and off-mine-site activities.
Notes: Total expenditures for 1975-81 are overstated by an average of about 17% relative to earlier and later years because of changes to the methodology used by Statistics Canada over the years. Data for 2007 are final. Expenditures for 1997 to 2007 include both exploration and deposit appraisal costs as per the new survey definitions; up to and including 1996, most of the expenditures now included in the deposit appraisal phase were reported under "exploration."

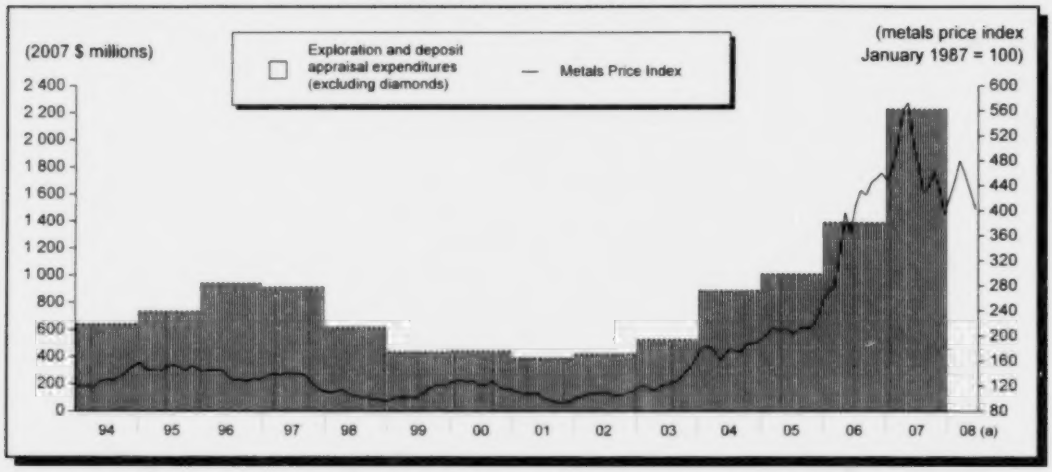
In this generally negative context, the introduction of exploration tax credits and other measures by the federal government and some provincial/territorial governments was welcome news and contributed, along with a rapidly improving metals price outlook across a broad range of commodities, to the recent recovery and effervescence in the Canadian mineral exploration sector. At the end of 2007, the outlook was still favourable for exploration and deposit appraisal activities despite increasing signs of economic turmoil in the near future.

METAL PRICES AND EXPLORATION AND DEPOSIT APPRAISAL LEVELS

Under normal circumstances, metal prices are the most important factor influencing the level of exploration and deposit appraisal activity. In early 1995, metal prices embarked on a generally downward trend, as reflected by Natural Resources Canada's Monthly Metals Price Index (based on the prices of copper, nickel, lead, zinc, silver, and gold), that lasted until mid-1999 (**Figure 17**). The index then recovered for about a year before heading downward again and bottoming out in October 2001 following the September 2001 terrorist attacks in the United States and amid generally low metal prices. The recovery that began afterwards picked up considerable steam in the second half of 2003 and continued towards new heights in 2004 and 2005. In 2006, the Monthly Metals Price Index really took off, reaching an historical high in December. Successive new highs were established in the first four months of 2007 and, in May 2007, NRCan's Monthly Metals Price Index was six times as high as it was in October 2001.

As outlined in previous editions of this report, there is a relationship between the level of spending in a particular year and metal prices in earlier years. The decreasing trend in metal prices that began in 1995 was not reflected in spending levels before 1997, partly because of that relationship and partly

Figure 17
Exploration and Deposit Appraisal Expenditures (Field Work and Overhead) in Canada, and Natural Resources Canada's Monthly Metals Price Index, 1994-2008 (Constant Dollars)



Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
(a) At press time, no data were available for field and overhead costs in 2008.
Notes: Exploration and deposit appraisal data up to 2007 are final. For comparison with pre-1997 years, the data include only field and overhead expenditures.

because of expenditures on the search for diamonds, which added an element of stability to exploration and deposit appraisal levels. When excluding diamonds, expenditures (field and overhead costs only) peaked in 1996, started declining in 1997, fell even more in 1998 and 1999, were mostly stable but low in the 2000-2002 period, and began to recover in 2003. They exploded in 2004 after the price outlook really showed signs of improving in the second half of 2003 and continued to improve greatly as prices continued to head higher and higher, pulling exploration spending towards the records discussed in this report. This relationship outlines the importance of improving metal prices in enticing higher exploration and deposit appraisal spending levels and, based on current metal markets, points to a negative short-term outlook.

EXPLORATION AND DEPOSIT APPRAISAL EXPENDITURES BY JUNIOR COMPANIES

As shown in **Figure 16**, junior companies have traditionally played an important role in Canadian mineral exploration and deposit appraisal activity. However, their contribution really expanded in 1984, a year after the introduction of MEDA, when their spending accounted for almost 24% of total exploration and deposit appraisal expenditures (field work and overhead). That proportion had more than doubled by 1987 when junior companies accounted for $1064 million (2007 dollars), or 51% of the total of over $2.0 billion (2007 dollars) spent during that year. Junior spending was also very important in 1988 with almost 50% ($1018 million) of total expenditures. Their proportion of total spending then started to gradually decrease until it reached 21% in 1992.

The levels of spending recorded by junior companies in the 1986-88 period are even more impressive when taking into account the fact that, during that period, considerable contributions were made by junior companies to joint-venture projects operated by senior companies. In the survey, these contributions were counted as part of senior companies' spending, thus overstating senior expenditures and understating junior expenditures.

On a yearly basis, junior spending accounted for approximately 30% of total expenditures (field work and overhead only) over the period 1993-2000. The discovery of diamonds in Canada's North and nickel-copper-cobalt at Voisey's Bay were the two most important positive factors affecting junior spending during those years. Low metal prices, a slowing world economy, and difficulties in raising financing explain the more difficult years. The introduction of the federal Investment Tax Credit for Exploration (ITCE) in October 2000 and related provincial tax credits, around that time and subsequently, were favourable to junior mining companies as their expenditures started to recover faster than those of senior companies. This recovery in junior spending was strong enough to increase their share of total spending (field and overhead costs) to almost 44% in 2003. The momentum continued to build in 2004 as junior mining companies accounted for 53% of all spending, the first time since 1987 (and only the second time in the history of Canadian mineral exploration statistics) that junior spending exceeded that of senior companies. Buoyed by strong metal prices and the eagerness of financial markets to fund mineral exploration activity, junior companies' spending continued to surge at a much faster pace than the expenditures of senior companies in 2005 and 2006. As a result, junior company field and overhead spending represented 60% of total spending in 2005 and 64% in 2006. The proportion of junior company spending continued to increase in 2007 as they accounted for 68% of total field and overhead expenditures. While the 2008 totals for field and overhead expenditures are not yet available, they will most probably show that junior companies continued to dominate the Canadian exploration scene.

EXPLORATION AND DEPOSIT APPRAISAL EXPENDITURES BY PROVINCE AND TERRITORY

Tables 13 and **14** show exploration and deposit appraisal expenditures (field and overhead costs only) by province and territory in terms of current dollars and 2007 constant dollars. Both tables cover the period 1993-2007, which includes the exciting discoveries of 1993 and 1994, the ensuing increase in spending up to 1996, the downward trend that brought exploration and deposit appraisal spending down to an almost historical low in 1999, and the latest upward trend that began so slowly in 2000 and has taken expenditures to record levels in 2007.

TABLE 13. EXPLORATION AND DEPOSIT APPRAISAL EXPENDITURES (FIELD WORK AND OVERHEAD) IN CANADA, BY PROVINCE AND TERRITORY, 1993-2007 (Current Dollars)

Province/Territory	Total Exploration and Deposit Appraisal (1)														
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
	($ millions)														
Newfoundland and Labrador	8.9	12.4	71.1	92.5	58.4	40.8	29.3	23.1	20.7	24.0	21.5	30.5	42.6	87.5	136.8
Nova Scotia	1.8	1.7	2.8	6.9	6.7	4.8	3.6	3.0	1.5	1.8	4.0	6.9	5.6	7.3	19.7
New Brunswick	11.1	10.0	12.7	14.8	12.2	10.0	10.0	12.0	9.4	3.2	2.5	13.2	9.8	13.3	35.0
Québec	106.1	130.3	123.4	137.2	168.6	123.5	103.4	89.9	94.8	104.0	128.0	209.4	199.5	272.7	441.9
Ontario	75.6	113.0	129.7	194.9	176.5	111.3	81.1	113.7	110.2	121.0	187.4	271.1	283.5	330.3	523.6
Manitoba	27.4	40.5	32.6	41.2	40.3	29.5	22.6	27.7	28.5	29.6	27.0	35.7	50.0	51.6	97.3
Saskatchewan	53.1	50.6	43.8	50.6	49.9	57.8	36.0	40.0	34.4	35.2	43.6	63.3	131.0	229.3	297.7
Alberta	7.3	9.4	10.6	10.8	20.5	21.6	11.4	6.1	4.3	5.6	4.6	4.3	5.0	17.3	9.8
British Columbia	66.0	85.0	79.4	104.9	95.8	44.3	33.4	29.9	25.6	34.5	52.6	130.6	164.7	236.2	392.1
Yukon	19.2	25.7	39.3	46.4	40.6	17.5	12.2	9.9	7.3	7.4	11.9	20.8	49.0	99.4	129.1
Northwest Territories	100.7	149.5	172.2	194.5	150.7	114.8	61.0	45.3	75.2	59.8	45.7	99.6	85.3	153.1	166.4
Nunavut	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	33.8	57.4	58.1	71.3	85.3	177.7	165.0	172.0	271.4
Total field work (excluding overhead)	410.1	540.5	608.1	835.9	749.5	522.4	387.6	412.3	415.8	434.8	552.7	966.7	1 107.5	1 560.0	2 384.3
Total exploration and deposit appraisal (including overhead)	477.3	628.1	717.6	894.8	820.2	575.9	437.9	458.1	470.1	497.2	614.2	1 063.0	1 191.0	1 669.8	2 521.0

Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
n.a. Not applicable.
(1) For comparison with pre-1997 years, the data include only field and overhead expenditures. They do not include other related expenditures such as those for engineering, environment and land access.
Notes: Numbers may not add to totals due to rounding. Data are final.

TABLE 14. EXPLORATION AND DEPOSIT APPRAISAL EXPENDITURES (FIELD WORK AND OVERHEAD) IN CANADA, BY PROVINCE AND TERRITORY, 1993-2007 (2007 Dollars)

Province/Territory	Total Exploration and Deposit Appraisal (1)														
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
	(2007 $ millions)														
Newfoundland and Labrador	11.9	16.4	91.8	117.5	73.3	51.4	36.4	27.5	24.3	27.9	24.2	33.3	45.0	90.2	136.8
Nova Scotia	2.4	2.2	3.6	8.8	8.4	6.1	4.5	3.5	1.8	2.1	4.5	7.5	6.0	7.5	19.7
New Brunswick	14.8	13.2	16.4	18.8	15.3	12.6	12.4	14.3	11.1	3.7	2.8	14.5	10.3	13.7	35.0
Québec	141.6	172.0	159.2	174.3	211.5	155.8	128.1	107.0	111.6	121.0	144.2	228.6	210.7	281.1	441.9
Ontario	100.9	149.1	167.4	247.7	221.3	140.3	100.6	135.4	129.7	140.9	211.1	296.0	299.5	340.6	523.6
Manitoba	36.6	53.4	42.1	52.4	50.5	37.2	28.0	33.0	33.5	34.5	30.4	39.0	52.9	53.2	97.3
Saskatchewan	70.9	66.8	56.5	64.3	62.6	72.9	44.6	47.6	40.5	41.0	49.2	69.1	138.3	236.4	297.7
Alberta	9.7	12.4	13.7	13.7	25.7	27.2	14.1	7.3	5.0	6.5	5.2	4.7	5.3	17.8	9.8
British Columbia	88.1	112.2	102.5	133.3	120.2	55.8	41.4	35.6	30.2	40.1	59.3	142.6	173.9	243.6	392.1
Yukon	25.6	33.9	50.7	59.0	50.9	22.1	15.2	11.8	8.6	8.6	13.4	22.7	51.8	102.4	129.1
Northwest Territories	134.4	197.3	222.2	247.2	189.0	144.8	75.6	53.9	88.5	69.6	51.4	108.8	90.1	157.8	166.4
Nunavut	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	41.9	68.3	68.4	82.9	96.1	194.0	174.2	177.3	271.4
Total field work (excluding overhead)	547.4	713.3	784.7	1 062.2	940.2	659.0	480.5	490.7	489.4	506.1	622.8	1 055.6	1 169.8	1 608.4	2384.3
Total exploration and deposit appraisal (including overhead)	637.1	828.9	926.0	1 137.1	1 028.8	726.3	542.8	545.2	553.2	578.8	692.0	1 160.7	1 258.0	1 721.6	2 521.0

Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
n.a. Not applicable.
(1) For comparison with pre-1997 years, the data include only field and overhead expenditures. They do not include other related expenditures such as those for engineering, environment and land access.
Notes: Numbers may not add to totals due to rounding. Data are final.